PAGE 6 PUBLISHING's

NEW ATARI USER

Issue 51 £1.95
August/September

XL/XE

RADZONE
THINK QUICKLY TO AVOID THE RADIATION

A-Z OF ATARI SOFTWARE
More Collectors Items

BARGAIN SOFTWARE FOR YOUR XL/XE
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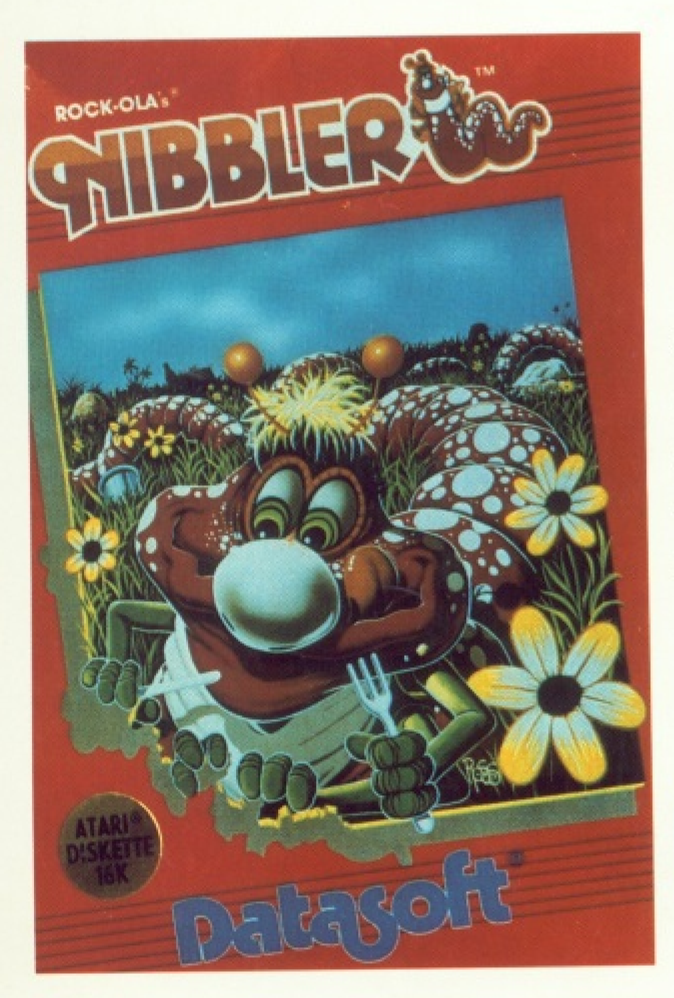
DISPLAY LISTS
How To Create Them

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MATHS PROGRAMS TESTED
HAT SOFTWARE - ANY GOOD?

plus .. TRADITIONAL GAMES ON YOUR ST
EMULATING THE XL/XE!
SAMPLING - the Technical side







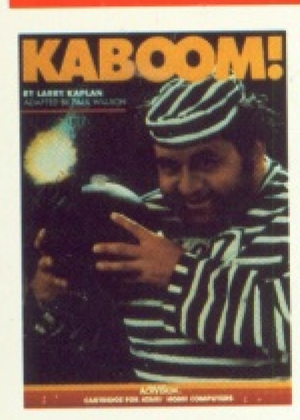
with orders over £10

*Yes a £9.95 Datasoft game absolutely FREE when you spend over £10 with the Accessory Shop. Check out the offers on this page and on pages 47 to 51 and send or phone your order. If it comes to more than £10 (excluding postage) we'll enclose a copy of this Pacman type game absolutely FREE if you ask for it.**

**NOTE the game is on disk only and we will not therefore include a copy automatically unless you order contains disks*

FULL DETAILS OF THE OFFERS AVAILABLE FROM THE ACCESSORY SHOP ARE ON PAGES 47 to 51. AN ORDER FORM IS ON PAGE 52

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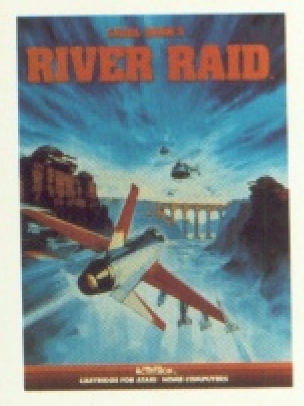


KABOOM

Challenge the Mad Bomber as he tries to bomb you out of sight. Can you catch his bombs and dowse them in time? Or would you like to be the Mad Bomber and try to flatten one of your friends? Lots of excitement for one or two players in this addictive arcade game that won awards for Best Audio and Visual Effects when it was first released. Simple yet addictive.

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OUR PRICE £2.95

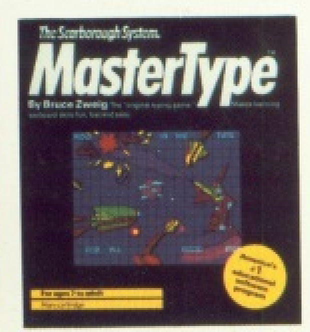


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This best-selling, all out battle adventure from Activision will have your palms sweating as you fly up river bombing enemy bridges, avoiding lethal choppers and hot air balloons. Can you survive far enough up river to discover its secret? Few can. Now this 1 or 2 player game can be yours at the lowest ever price. Bombs away!

ROM CARTRIDGE

OUR PRICE £3.95



MASTERTYPE

Now anyone can learn to type whilst playing a challenging game. Mastertype was one of the original 'game based' typing tutors which requires you to zap enemy words as they approach from the four corners of the screen. But it not really a game for, before you realise it, you will become quite proficient on the keyboard as you progress through 18 lessons of increasing complexity.

ROM CARTRIDGE

OUR PRICE £2.95

SUPER SPECIALS

ATARI SMASH HITS 7

FOUR of the best games for the Atari in one pack at the amazingly low price of just £2.99. Are these sub quality games? No sir! Not with Colossus Chess 3.0, Electraglide, Blue Max and Alley Cat as the selection, any one of which would be a bargain at £2.99 but you get all four! You had better hurry!

DISK ONLY — *Recommended price £14.95*

SUPER SPECIAL JUST £2.99

MAXWELLS DEMON

Check out the review in Issue 49. Paul Rixon found this simple game to be quite addictive and at this price can you afford not to become addicted! It's a different type of game, more in the Tetris mould than an arcade game. It sure makes you think and the price won't break you if you don't get fully hooked.

DISK ONLY — *Recommended price £9.95*

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One of the most famous of platform games that has you jumping over fire, running over breadmills and bombs, climbing ladders, sliding down poles and more with some great graphics. Master all 22 screens if you can and then create your own for neverending fun. This is what platform games are all about.

DISK OR CASSETTE — *Recommended price £7.95 cassette/£9.95 disk*

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ZAXXON

One of the all time classics for the Atari, Zaxxon set new standards when first issued and was copied many times. Pilot your craft across the unique 3 dimensional battlefield shooting enemy fuel tanks, anti-aircraft tanks and missiles before launching off through space for the ultimate conflict with a mighty robot - few have got this far! Zaxxon, often copied, never bettered and NEVER at this incredibly low price!

DISK OR CASSETTE — *Recommended price £7.95 cassette/£9.95 disk*

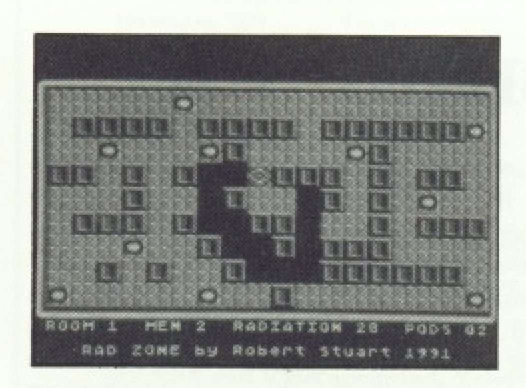
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CREDIT CARD ORDERS MAY BE TELEPHONED TO 0785 213928

'The magazine for the Dedicated Atari User'

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Issue 51 - August/September 1991



RADZONE
A thinking challenge - great graphics

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SUBMISSIONS

PAGE 6 welcomes and encourages its readers to submit, articles, programs and reviews for publication. Programs must be submitted on disk or cassette, articles should wherever possible be submitted as text files on disk. We seek to encourage your participation and do not have strict rules for submissions. If something interests you, write a program or article and submit it! Appropriate payment will be made for all published programs and articles, all payments being made at the end of the second month shown on the cover of the issue concerned.

The next issue of NEW ATARI USER will be on sale 26th September
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PAGE 6 PUBLISHING's
NEW
ATARI
USER

Issue 51
August/September 1991
'The Magazine for the Dedicated Atari User'

ISSN No. 0958-7705

THE CREDITS

All of the usual stuff is on page 3 but here are the people who made this issue possible.

Les Ellingham spent the usual couple of weeks locked away in the back room banging away on the keyboard, trying to keep warm and wondering if the sun is going to shine this year

Sandy looked after the ads, did the mail order and all the usual things that keep us ticking over

Paulette keeps changing the office round, inventing new systems, thinking up new ideas, even tying all the pens to the desks so Les can't pinch them! Still, as long as she keeps buying the Eccles cakes we'll let her get on with it.

Stacey used to come in and see us but ever since she became famous with Champion Middle White at the Gloucester Show and other awards we hardly ever see her. She's probably too busy going to the Royal Garden Parties and having tea at Chatsworth.

The Regular Contributors, who provide the backbone of the magazine and can generally be relied upon to come up with good articles and reviews, are ....

John S Davison	**John Davison jr**
John Sweeney	**Paul Rixon**
Damon Howarth	**Ian Finlayson**
Peter Hickman	**The Tipster**

All other contributors for this issue are individually credited alongside their articles or programs. Thanks to everybody for sharing their enthusiasm with other Atari users.

Last issue's cover was by Paul Lingwood after all but this one is a screen shot of **RADZONE** by **Robert Stuart** taken with the old box brownie

Dozens of different folks inspired this issue, all on one CD! Normally I don't like compilations but a real cracker is Bringing It All Back Home from a forthcoming BBC series on Irish music, probably being aired around the time you read this. There are 37 tracks and not a duff one among them including many that I had not heard before such as The Lee Valley String Band and Pierce Turner. Add such favourites as Mary Black, Paul Brady, Davy Spillane, Maura O'Connell and The Waterboys amongst many others and you have near on 150 minutes of sheer joy! The others who helped are Runrig with a new album that is ... well, Runrig and you can't say any better than that. OMD have an excellent new one and a guy called Don Grusin helped pass away the time, not brilliant but quite nice. I'm off now to find a CD by The Lee Valley String Band or Michael O'Suillebhain and The Irish Chamber Orchestra. Wonder if Boots will have a copy?

The next issue of NEW ATARI USER could feature YOUR article or program, so SEND IT IN NOW!

PAGE 6 shows just what you can do with your Atari. NEW ATARI USER has always been created entirely with Atari equipment, initially on the XL but more lately with a Mega ST and other stuff, who needs PC's or Macs! With the exception of the final output on a Linotron and the use of an in-house repro camera for the photos and listings everything is done on the ST. Hardware includes a Mega ST2 (upgraded to 4Mb), SM125 Monitor, Supra 30Mb Hard Disk, an Atari Laser Printer, Citizen 124D printer, Philips CM8833 monitor, 130XE, XF551 disk drive, 810 disk drive, 850 interface, NEC 8023 printer. Principal software used is Protext and Fleet Street Publisher 3.0. Other software includes Kermit, TariTalk, Turbo Basic and various custom written programs on the XL/XE. Articles and programs submitted on XL/XE disks are subjected to various custom written programs before being transferred across to the ST via TARITALK. All major editing is done with Protext and pages are laid out with Fleet Street Publisher. A disk with the finished pages as Postscript files is sent to a typesetting bureau to be output on a Linotron and, hey presto, finished pages are sent back exactly as you see them. It really does work! All that is left is to drop in the listings and photos.

Well, it's not quite as easy as that but you get the idea!

Editorial

ORDERS PLEASE!

We had one or two production problems with the last issue which resulted in many of you having a real hassle to obtain a copy from the newsagents. We had already put back the publication of the issue for one week due to some personal commitments but that still allowed plenty of time to get it on sale before the end of the month. The big problem was that the people who do the film failed to get it to the printers on time and so it was delayed even further. This caused mayhem amongst the newstrade with customers being told anything from '*they've gone out of business*' to '*it's been deleted from the database*' to '*you can't buy it any more, it's being given away free in another magazine*'!! Eventually most people got their copy but we certainly lost a fair number of sales from readers who believed what they had been told.

All of this exacerbates the situation mentioned in the last editorial and so we have to make a decision regarding the future distribution of the magazine. At the moment the magazine is distributed on a 'sale or return' basis meaning that the newsagent can order as many copies as he likes and only has to pay for those that he sells. The rest are returned to the warehouse and subsequently destroyed and we, of course, have to write off the (quite substantial) printing cost of these copies. The alternative method of sale through the newsagents is on 'firm sale' where the newsagent stocks only those copies he knows he can sell and we get paid for every copy. The disadvantage is that the shops will cut their orders and you will be unlikely to be able to pick up a casual copy.

We want to keep the magazine on general sale however and therefore, from the next issue (Issue 52) we will adopt the 'firm sale' policy but it does mean that ***YOU MUST PLACE AN FIRM ORDER WITH YOUR NEWSAGENT FOR FUTURE COPIES OF THE MAGAZINE*** unless you take out a subscription (which, naturally, we would like you to do). There is no commitment on your part to order a number of copies or to pay in advance but you do need to tell your newsagent that you want a copy and you should do it NOW to ensure that he orders sufficient copies. Although any newsagent will still be able to stock NEW ATARI USER you will probably not see it on the shelves as all copies will have been ordered. You must place the order.

An alternative, of course, is to subscribe which can actually work out cheaper. This way you know that you will never miss a copy and you will receive all the various offer leaflets that we include with subscribers copies.

We believe that this is the right course to ensure that you can continue to enjoy a magazine that supports the 8-bit Atari and gives an alternative viewpoint on the ST. All we need now is for you to show that you still want the magazine. Order or subscribe!

XL/XE ALIVE

A number of people have written to complain that they have sent money to XL/XE ALIVE and not received the goods or a reply. Bill Sutton, who was running XL/XE ALIVE, telephoned us to say that he had ceased trading due to a number of problems, principally concerning the supply of disk drives which he had paid for and which did not materialise. Mr. Sutton has stated that he will ensure that any outstanding monies are refunded if customers contact him at the address shown on his adverts. Unfortunately the telephone number shown has been disconnected so we suggest that any claimants send a polite letter by recorded delivery detailing any outstanding items. Hopefully everything will be resolved to everyone's satisfaction.

IMPORTANT NOTICE

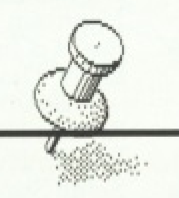
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alternatively you can subscribe - see page 27

IF YOU REQUIRE ANY ADVICE ON HOW TO ORDER A COPY OR HAVE ANY PROBLEMS PLEASE TELEPHONE US ON 0785 213928

Mailbag





Must remember to write to Mailbag

P.O. Box 54
Stafford
ST16 1DR

BUYING THE MAG

With reference to you editorial remarks in Issue 50, I for one would be very sorry to see you have to go back to being a subscription only magazine. Mu main reason being, as a pensioner, I would probably have difficulty finding a lump sum for the advance payment. Maybe you could, if it comes to it, find a method for the likes of me to pay by postal order for each issue?

Now onto another subject. I have typed in the VBI Scroll program (Issue 50) and it locks up solid when I press BREAK to enter POKE 708 as instructed to change the colour. I get ERROR 146 - FUNCTION NOT IMPLEMENTED. Any clues?

K. Edwards,
Runcorn

The goods news Mr Edwards is that you will still be able to get New Atari User from your newsagent as mentioned elsewhere (several times!) in this issue but you must place an order with the newsagent. All this means is that you simply ask the newsagent to put you by a copy each issue, there is no obligation for you to take a number of issues and no need to pay in advance, but you must place the order otherwise you won't be able to get a copy. We have taken this course for readers such as yourself but is important for you to show your commitment and place that order. If you should miss a copy, then you can always order directly from us at the normal cover price, we don't charge any extra for postage.

On your other question, we are not sure of the problem. Our copy from which the listing was prepared works perfectly when the Break key is pressed. Possibly you have missed out a line in the program (unlikely as it probably wouldn't run at all). Are you using Turbo Basic? It could be that the machine code routines are not compatible, we have to admit that we didn't test this program with Turbo Basic.

THE WORKS!

I am a 13 year old 800XL owner and I have started to program games but there are a few things that I need some help on and I would be grateful if you could help me.

The first thing I would like to know is how can you design characters that are more that 8 pixels high. Still on the subject of characters, how can you design them with more than one colour in them? I would also be grateful if you could help me with music and background graphics. I cannot figure out how they get the musical effects in most of the expensive games and I would like to be able to do this. With the background graphics most games turn out brilliant but I am not sure how to do this. One last thing, could you tell me how to program a loading screen, because I would like to give my games a professional look.

Chris Hopper
Fetcham

A tall order, Chris! You will find that writing good programs comes with experience and you need to study other programs and read everything you can to pick up all the routines and tricks needed. Most of what you require has been covered in New Atari User in the past but things like character redefinition were published many years ago in issues that are now out of print. We haven't published this type of article since the early days and it is probably now time that we covered this ground again. Over to the experts in the readership, let's have the definitive article! Things like background music and loading screens that you see in commercial games require to be programmed in machine code and normally articles can only give general guidance, leaving the actual programming up to the programmer, but we have recently published some programs that you could adapt like DAVE T's DISCO and the scrolling message routine in the last issue. We also have a Games Backdrop Designer program in the pipeline for a future issue that will probably help. Keep reading, Chris, keep experimenting and take as many routines out of other listings as you can. In this way you'll begin to develop your own ideas and you should end up a good programmer

FULL MARKS?

I am writing to ask if you could give marks out of ten in the game reviews because it would help me and other readers to work out if it is worth buying.

Gary McShimming
Colston,
Scotland

We've always avoided giving marks to software because the evaluation is so subjective, (as is the actual review to a degree) and a game might get a high score simply because the reviewer is into that type of game. We like to feel that our reviews give enough background on a game to enable the reader to judge for themselves the worth. Quite often a review will end up with a strong recommendation to go out and buy but you will know from the review just why that recommendation has been given. If there is a mass desire from readers for games to be marked then we can do it, but will it really mean anything?

CHANGING CHANNELS

In Issue 48 there was a letter on the subject of changing the Atari's preset channels. The way to do this on the XE is if you look on the bottom of the XE you will find a small hole on the left of the label. Insert a trimming tool and you should be able to change the channels.

Also I have been able to locate a source of supply for the XL/XE BASIC ROM chips (which should fit the 400/800) price £4.49 and the thermistor for the ST's PSU price £1.34. These are available from Marpet, 1 Hornbeam Mews, Gloucester, GL2 0UE

Jon Rushton,
Telford

Thanks for the info, Jon, but the trimmer you mention is merely a fine tuning device and does not change the channels significantly. It is useful however if you find that your TV picture is a bit wavy or if the colours are not correct. You can quite often get better sound and graphics by playing with this trimmer. If you want to have a go, make sure that you use a plastic trimming tool and not a metal screwdriver. A small set of trimming tools can be had from Tandy for a couple of pounds.

GOOD SUPPORT

After recently spotting an advertisement for new Atari 8-bit games, I decided to write away and buy without waiting to see a review in your magazine. The Hi-Tec Software ad was for various releases of NEW games based on the Hanna-Barbera cartoons. I simply could not believe how many titles were available to Atari 8-bit users and I felt urged to put pen to paper and tell others about this find.

I've received the two Yogi Bear games, both are very good (indeed Yogi's Great Escape is excellent!) and I am awaiting the release of Top Cat. I intend to buy all these games if not just to show my support to the Atari community but in thanks for the great speed and brilliant service from Hi-Tec.

So keep up the good work, Hi-Tec, I know plenty of people who will always support you, especially me!

Ray Griffiths,
Luton

It is nice to hear that a company still supporting the Atari can give good value and good service but Hi-Tec seem to be a curious company. You were lucky to see an advert for Atari games (where did you see it, in a Spectrum magazine?) because we have asked Hi-Tec on a number of occasions if they would like to advertise their Atari games in New Atari User and we have never had a response. Indeed we can't even get review copies from Hi-Tec, we have had to go out and buy the games ourselves so that you can read the reviews and Hi-Tec can make the money. I simply don't understand why companies who support a particular machine don't advertise and promote the fact to the right market. No wonder software publishers stop supporting certain machines on the grounds that the software does not sell. If they don't promote it, how on earth do they expect to sell it?

MYSTERY SOFTWARE

I have just returned to the Atari 8-bit and can anyone help me find a game I enjoyed very much? I do not remember the name of the game, but I hope that I can describe it well enough to jog a memory or two.

It was a racing game, supplied on disk in a silver wallet with a chequered pattern with the name of the game on it. It featured a number of different cars which ranged from moon-buggies to Corvets through 4x4 and also had the ability to adjust the gravity of the track from Venus (lots) to the Moon (none). Oh yes, there were also two motorbikes. It also has lots of tracks that you could load. The main feature of the game was the screen! The display was split in two and the players used separate screens, also the cars could drop mines.

I hope that has jogged a memory or two. I will gladly pay a reasonable price for an original copy of this game on disk.

Mark Greenall
St. Helens

Thanks for the review! If anyone knows this game perhaps they could drop us a line to put everyone out of their misery and you can write direct to Mark at 2, Hinckley Road, Islands Brow, St. Helens, Merseyside, WA11 9HU

ART ON CASSETTE

I recently purchased a secondhand Atari 800XL to use for computer artwork because it seemed that the 800XL was the best 8-bit for this task. The problem is that I can't find any suppliers that stock art packages for the 800XL. I've read old issues of Atari User and seen many art packages reviewed. Could you recommend any suppliers or would one of your readers who has an art package on cassette be willing to sell me one?

Brian Hoskins,
Redditch

Probably the best art program on cassette was PAINTBOARD which was produced by Amethyst Software and advertised in these pages a year or so ago. It is no longer available as a normal cassette although Derek Fern of MICRO DISCOUNT now has a version in Turbo Load format (for which you require an adaptor on your tape deck). Others to consider are ROM cartridges such as Atari Artist but you'll have to get these secondhand now, try putting a wanted ad in our next CONTACT column.

SUPPORT US!

Having just read the editorial at the front of last month's magazine, I thought you might be interested in a previous experience of mine.

Back in 1981 I purchased a home computer called a Colour Genie. Although never popular with the major software houses I thought it was an excellent machine. Of course, in time, commercially produced software dried up but the User Group continued to produce good software and an informative magazine. Eventually though appeals to the readership to buy software and write articles fell on deaf ears and faced with the lack of response the User Group, which was a national one, finally folded. The losers were the computer owners themselves.

I now find the Atari 8-bit in the same situation. I appeal to all users to subscribe to this excellent magazine and support those who are trying to support you. Keep up the good work.

Chris Thorley,
Albrighton

PAGE 6 WRITER CORRECTION

A chance misfortune (it's a bit too complicated to explain!) at the stage of adding the tints to the program listings lead to a line being missed from the bottom of the listing on page 30 of the last issue.
Line 1600 should be as follows

```
TL 1600 DATA 3F9005F0034C4329B186C900F0E9
   C90EF0E5C901F0E1C91FF0DDC95EF0D94C3429
   AD863F8DED3FAD873F8DEE3F,657
```

Please accept our apologies. Now you can type it all in, it's a great program.

QUESTIONS &A

When you set out to write a quiz program a number of matters have to be considered apart from deciding on the actual questions and answers. Should you opt for a multiple choice type quiz or do you want the user to input the exact answer? How do you get the computer to ask questions in random order each time? Can you ensure that a question, once asked, will not be repeated? This article sets out to answer these and other questions with the help of the accompanying program listing.

TYPE OF QUIZ

Multiple choice type quizzes tend to be more popular than those where the player is expected to type in the right answer - they are easier and quicker to use and you don't have the problem whereby a "right" answer is rejected because it was spelt incorrectly. On the other hand, some people don't like multiple choices because they involve lucky guesses as well as "skill"; this is even more so with true/false quizzes, where you have a 50% chance of being right every time.

The listing shown here gives you a choice between the two quiz types. The questions and answers used for the *'type the answer'* quiz are stored as DATA statements at LINES 1010-1080 while those for the *multiple choice* quiz are at LINES 2010-2080. As explained below, each round of the question loop directs the computer to a particular DATA line (using RND(0) and RESTORE) and gets it to READ strings in sets of 2 or 4, depending on the type of quiz. The routines assume that the order of storage take the form question-answer or question-right answer -wrong answer-wrong answer as appropriate.

GENERAL STRUCTURE AND OPENING ROUTINES

The general structure of any quiz will be along the lines of the following:

- *For count = 1 to the number of questions*
- *Computer selects a question and prints it on the screen*
- *Player gives an answer*
- *Computer checks the answer and goes to a different subroutine if you're right or wrong*
- *Computer goes on to the next question*

When the program begins you are given a choice of quiz type (LINES 150-160): The location of the data and some of the routines used depend on the choice made here and these variables are defined in LINE 190. LINES 210-220 offer a choice of the number of questions to answer and LINES 230-235 set up a graphics 0 question screen which gives a running tally of question number(N) and score (SC).

COMPUTER SELECTION OF QUESTIONS

We check that the question wasn't asked before by using an array:- DIM F(NQ) in LINE 110 sets aside space in the computer for a one-dimensional numeric array called "F". This has spaces for NQ+1 elements, where NQ is the number of questions in the quiz (defined in LINE 100). Numeric arrays count from zero, not one; that's why there is one extra place, however the program ignores the F(0) location as it is easier to say F(1) is for the first question, F(2) for the second ... etc.

LINE 240 sets all the elements in the array to zero before the question loop begins. LINE 250 selects a random whole number between 1 and the number of questions in the quiz. If the flag for this number is not zero it means the question was asked already so the computer will pick another number and stay on this line until it gets a fresh question. LINE 260 then sets the flag for this number question at 1 so that it is eliminated in subsequent rounds.

Next the computer reads a string from a data line which we specify using the RESTORE command in LINE 260. The value for DAT will either be 1000 or 2000, depending on the quiz type (see LINE 190) and Q is our random number. For example, if DAT is 2000 (multiple choice quiz) and Q is 4, the computer will read the first string it comes across in line 2040 (2000+10*4). This will always be a question (because of the order in which we input the data); it is displayed on the screen letter by letter together with a short sound (LINES 270-275)

At this stage the routines differ slightly depending on quiz type so the program either goes to LINE 300 (type the answer) or LINE 600 (multiple choice) depending on the choice made in LINE 170. (The variable "GAME" was defined in LINE 190).

KEYBOARD INPUT

Computer reads answer:

LINE 300 directs the computer to read the next string it encounters; this will be the answer accompanying the question selected at LINE 260 because of the way the DATA is stored. The FOR NEXT loop in LINES 300-320 looks at each space in the answer and prints a dash on the screen if there's a character there and a blank space otherwise. This can be a useful hint if, for instance, the answer is a person's name and the player is unsure about whether to input the surname only or the Christian name too.

Player gives an answer:

Apart from the dashes, there are a couple of other ways to cut down on the possibility of having the "correct" answer rejected: POKE 702,64 puts the computer into capital letters mode as the answers are in this format and POKE 694,0 disables the inverse key. These are put in before the player inputs the

ANSWERS

Ann O'Driscoll explains what is needed to program your own quiz game

answer to each question (LINE 330) in case the keys are accidentally pressed between rounds.

Computer checks the answer:

The inputted answer in the string TRY$ is compared with the computer's answer in A$ (LINE 340). If they match the program is directed to the subroutine at LINE 800, otherwise it goes to the routine at LINE 810

MULTIPLE CHOICE

Computer reads answers:

LINE 600 directs the computer to read the next 3 strings in the DATA list; these will be the right answer and the 2 wrong answers which go with the current question. LINES 610-630 print the answers on the screen in a random order, depending on the value of a random number, R, between 0 and 1 generated in LINE 600. For instance, if R is more than 0.65 LINE 620 says print the answers with the right one in the middle; the computer then notes that right is second. The other lines work in the same way.

Player gives an answer:

The player selects one of the numbered options which are listed on the screen by pressing a key. The program stays at LINE 640 until 1, 2 or 3 is pressed.

Computer checks the answer:

The correct answer has already been flagged when the options were put on the screen by LINES 610-630. The computer now checks if the number pressed is correct and goes to the subroutines at LINES 800 or 810 accordingly.

RIGHT AND WRONG ROUTINES

LINE 800 is specifically for right answers, LINE 810 is for wrong answers and LINES 820-840 are common to both. The variables used are SC for score (you get 5 points per right answer) and P for pitch - the sound differs if you're right or wrong. LINE 840 prints a couple of rows of blanks over the previous question/answers. BL$ is a string containing spaces which was set up in LINE 110. This was used instead of a clear screen command so that the top few lines showing question number and running score wouldn't have to be repeated at each go.

QUIZ OVER

When the loop counter reaches its target (LINE 360 type the answer; LINE 670 multiple choice) the program goes to LINE 850. The screen is cleared and the results are displayed. Pressing any key re-runs the program and brings you back to the title screen.

MODIFICATIONS

This is only a short listing to show the principles behind quiz programs; there is plenty of scope for improvement such as inclusion of a nice title screen or opening menu. Change NQ in LINE 100 to alter the number of questions. LQ and LA - question and answer length respectively - may also be changed, but be careful here as longer strings might mess up the screen display.

When you are putting in new data, remember to follow the Question: Answer or Question:Right:Wrong:Wrong Answer order. You may have noticed that there is in fact no need to use separate data for the two quiz types; the computer will read one or three strings after each question, depending on the quiz selected. In any event, DAT in line 190 defines the beginning of the DATA list and all questions must start on program lines which are in multiples of 10 from this (i.e. DAT+10, DAT+20, etc.)

Finally, when setting your own questions, it makes things more interesting if the options in the multiple choice quiz are kept fairly similar. Also, you should try to avoid apostrophes, full stops, etc. in a type the answer quiz as these can be confusing.

Happy quiz-making!

PROGRAM OVERLEAF



QUESTIONS

```
CS 1 REM ########################################
VB 2 REM #     How to write your own        #
RR 3 REM #              QUIZ                #
AK 4 REM #        by Ann O'Driscoll         #
SG 5 REM # -------------------------------- #
HA 6 REM #  NEW ATARI USER - AUG 1991       #
CY 7 REM ########################################
NN 8 REM
PC 99 REM  QUIZ PROGRAM 
SM 100 NQ=8:LQ=39:LA=20:SC=0:CLOSE #1:OPEN #1,4,0,"K:"
LC 110 DIM Q$(LQ),A$(LA),TRY$(LA),W1$(LA),W2$(LA),F(NQ),BL$(39):BL$(1)=" ":BL$(39)=" ":BL$(2)=BL$
JW 149 REM  TITLE SCREEN 
DW 150 GRAPHICS 2:POKE 752,1:POKE 710,0:POKE 709,30:POSITION 4,0:? #6;"music quiz":POSITION 0,3
PX 160 ? #6;"1 = TYPE THE ANSWER":? #6:? #6;"2 = MULTIPLE CHOICE":? #6:? #6;"3 = QUIT":? "▸   PRESS 1 2 or 3"
HN 170 GET #1,KEY:KEY=KEY-48:IF KEY<1 OR KEY>3 THEN 170
WM 180 IF KEY=3 THEN GRAPHICS 0:POKE 82,2:POKE 752,0:POKE 764,255:END
WU 190 GAME=KEY*300:DAT=KEY*1000
CA 210 ? CHR$(125):? "HOW MANY QUESTIONS (1 - ";NQ;") ";:TRAP 210
JK 220 INPUT NO:IF NO<1 OR NO>NQ THEN 210
RA 230 GRAPHICS 0:POKE 82,0:POKE 710,48:POKE 712,48:POKE 709,12:POKE 752,1
UN 235 POSITION 0,2:? "QUESTION:  ";N:POSITION 20,2:? "SCORE: ";SC
PU 240 FOR N=1 TO NQ:F(N)=0:NEXT N
FF 245 FOR N=1 TO NO
SL 250 Q=INT(RND(0)*NQ+1):IF F(Q)<>0 THEN 250
FT 260 F(Q)=1:POSITION 11,2:? N:RESTORE DAT+10*Q:READ Q$
YS 270 POSITION 0,7:FOR L=1 TO LEN(Q$):? Q$(L,L);:SOUND 0,60,10,12
FS 275 FOR D=1 TO 20:NEXT D:SOUND 0,0,0,0:NEXT L:? :? :GOTO GAME
UP 299 REM  TYPE THE ANSWER QUIZ 
OM 300 READ A$:FOR L=1 TO LEN(A$):IF A$(L,L)<>" " THEN ? "-";:GOTO 320
LE 310 ? " ";
OG 320 NEXT L:? :?
EJ 330 POKE 702,64:POKE 694,0:INPUT #16;TRY$
XY 340 IF TRY$=A$ THEN GOSUB 800:GOTO 360
UJ 350 GOSUB 810
LV 360 NEXT N:GOTO 850
MH 599 REM  MULTIPLE CHOICE QUIZ 
BB 600 READ A$,W1$,W2$:POSITION 0,9:? "1.":POSITION 0,11:? "2.":POSITION 0,13:? "3.":R=RND(0)
MM 610 IF R<0.34 THEN POSITION 5,9:? A$:POSITION 5,11:? W1$:POSITION 5,13:? W2$:RIGHT=1:GOTO 640
LK 620 IF R>0.65 THEN POSITION 5,9:? W1$:POSITION 5,11:? A$:POSITION 5,13:? W2$:RIGHT=2:GOTO 640
NL 630 POSITION 5,9:? W2$:POSITION 5,11:? W1$:POSITION 5,13:? A$:RIGHT=3
UO 640 GET #1,KEY:IF KEY<49 OR KEY>51 THEN 640
FY 650 KEY=KEY-48:IF KEY=RIGHT THEN GOSUB 800:GOTO 670
UO 660 GOSUB 810
MA 670 NEXT N:GOTO 850
CZ 799 REM  RIGHT OR WRONG 
LL 800 POSITION 0,17:? "CORRECT!":P=20:SC=SC+5:POSITION 27,2:? SC:GOTO 820
AI 810 POSITION 0,17:? "No, the answer is ";A$:P=80
NU 820 SOUND 0,P,10,12:FOR D=1 TO 99:NEXT D:SOUND 0,0,0,0
BI 825 POKE 764,255:POSITION 0,19:? "Press a key to continue"
II 830 IF PEEK(764)=255 THEN 830
ZK 840 FOR B=7 TO 19 STEP 2:POSITION 0,B:? BL$:NEXT B:POKE 764,255:RETURN
GH 849 REM  QUIZ OVER 
FM 850 GRAPHICS 2:POKE 752,1:POKE 710,0:POKE 709,30:POSITION 4,0:? #6;"game over":POSITION 0,3
TX 860 ? #6;"QUESTIONS TRIED ";NO:? #6:? #6;"QUESTIONS RIGHT ";SC/5:? "▸   PRESS A KEY"
```

& ANSWERS

```
RY 865 IF PEEK(764)=255 THEN 865
VG 870 RUN
WZ 1010 DATA WHO WROTE THE UB40 HIT 'RED
   RED WINE',NEIL DIAMOND
WW 1020 DATA WHO HAD AN AMAZING DANCING B
   EAR,SIMON SMITH
AA 1030 DATA WHO DROVE HIS CHEVVY TO THE
   LEVY,DON MCLEAN
ZO 1040 DATA WHAT WAS THE HMV DOG CALLED,
   NIPPER
DM 1050 DATA WHO HAD A HOLE IN THEIR SHOE
    IN 1967,TRAFFIC
DK 1060 DATA WHAT WAS ZAGER & EVANS ONE H
   IT WONDER,IN THE YEAR 2525
VL 1070 DATA WHO WENT FROM NEW YORK TO L.
   A.,PATSY GALLANT
IC 1080 DATA WHAT WAS SWEETS ONLY NUMBER
   ONE,BLOCKBUSTER
KR 2010 DATA WHO HAD A HIT WITH 'HORSE WI
   TH NO NAME',AMERICA,CHICAGO,JOHN DENVE
   R
ND 2020 DATA WHO WAS LEAD SINGER WITH THE
    DOORS,JIM MORRISON,VAN MORRISON,CHUCK
    MORRISSEY
LW 2030 DATA WHOM DID PAUL ANKA SING ABOU
   T,DIANA,SARAH,CLAIRE
JA 2040 DATA NAME HAROLD MELVIN'S BACKING
    GROUP,THE BLUENOTES,THE DAKOTAS,THE B
   ELMONTS
HC 2050 DATA WHO WERE SCOTT JOHN AND BARR
   Y,WALKER BROTHERS,RIGHTEOUS BROTHERS,E
   VERLY BROTHERS
QZ 2060 DATA WHAT WERE THE BEACH BOYS ONC
   E CALLED,CARL & THE PASSIONS,THE WILSO
   N BROTHERS,BRIAN & THE SURFERS
CE 2070 DATA WHICH WAS A HIT FOR MANFRED
   MANN,DO WAH DIDDY DIDDY,YUMMY YUMMY YU
   MMY,OB-LA-DI OB-LA-DA
UN 2080 DATA WHO WAS THE MONKEES DRUMMER,
   MICKY DOLENZ,PETER TORK,DAVY JONES
```

WRITING ADVENTURES

In this fourth, and last, article of a series about the construction of text adventures, I shall look at advanced programming techniques and also at some of the tools used as programming aids.

DISPLAY

The display of the adventure that appears on the screen is the most critical part of the program, from the user's point of view. Whatever brilliant programming may lie beneath the surface, the user is bound to assume that if the visible part is no good, then neither is the submerged seven-eighths.

The first part, then, that requires attention is the use of English in the messages displayed by the adventure. There is nothing more off-putting than a phrase like "There is, an ongoing, crisis sitewation", which proves only that the programmer has an ongoing inability to use, spell or punctuate English properly- situation. So, for goodness' sake, use the Queen's English and, if necessary, a good spelling checker (unless you're intending to sell to the French market, in which case you'd better write good French!).

Many adventure programs use a split screen display where the top half of the screen indicates the room and its contents, and does not scroll, while the lower half contains the actions entered by the player and the program's responses to those actions. The second, lower half of the screen does scroll. This is rather like the split-screen display which can be achieved in graphics mode 0 with POKE 703,4, but the latter instruction gives a split-screen display in which only the bottom four lines are available for the user's input and the program's responses.

The top half of a two-part screen display needs to contain only the description of the current room and the list of contents. It is possible that the list of contents may be very large if the player has decided to form a 'dump' in this room of everything he can lay his hands on. It is therefore necessary either to provide sufficient space to show the contents of every moveable object within one room or, better, to write a more flexible routine which creates more space for the top half of the screen as the number of items accumulated there increases. Scott Adams' adventures provide good examples of this type of screen format.

The best means of implementing such a split-screen display regrettably involves the use of two custom-written display handlers, one for each half of the screen. The use of display handlers is a complex subject, outside the scope of this tutorial, and is of most value to machine code programmers since the handlers have to be modified by the addition of machine code routines. The interested reader is referred to "De Re Atari", Atari's own publication about the operating system of their 8-bit computers.

Alternatively, the programmer can write a machine code routine which effectively mimics the action of the two display handlers but, being custom-written, is easier to implement.

There remains, however, the possibility of a 'fudge' solution. An easier remedy is to provide a machine code routine which divides the two halves of the screen, counts whenever the number of lines of messages in the bottom half of the screen reaches the bottom of the screen (row 23), and then blanks the bottom half of the screen, resetting the message cursor to the top of the lower half of the screen.

This routine works rather well, although it is a little tiresome to have to keep counting the screen row on which the next message will be displayed. For example, after an INVEntory, the program must print out a line of possessions held by the player, testing the vertical screen position of each message.

The same principle can be used from Basic, calling a short machine code routine. The display program listed here contains a general purpose, two-part screen utility, in which the sizes of the two parts of the screen are programmable. The machine code routine is quite lengthy (see the number of DATA statements), although the twin screen handler mentioned above would have been much longer.

The full display program illustrates the use of the machine code utility. The key feature is the call to the machine code with the line:

```
X = USR(1536,N,VERT)
```

where:

1536 = beginning of machine code routine (in page 6)
N = 0 to clear the top half of the screen
N <> 0 to clear the lower half of the screen
VERT = vertical position where the screen will be broken in two, counting in rows from the top of the screen. VERT must be altered to suit the size of the room description in the top half of the screen, but must in any case never be less than 2 or greater than 20, or the computer may lock up (the machine code routine provides no safety check).

The Basic part of the program requires the cursor position for printing messages to be adjusted after each call to the machine code routine.

RUN the program and type in any messages you like, pressing RETURN after each message. When the cursor reaches the bottom of the screen, the program will suddenly clear the lower half of the screen and the cursor will reappear just below the

ES 4

John White concludes his series with some advice on how to speed up your programs and introduces a more sophisticated screen display

screen break.

Alternatively, type in '1' (RETURN) to force the lower part of the screen to be cleared, or type in '0' (RETURN) to force the top part of the screen to be cleared, after which the room description will again be displayed. In the second case, note that the cursor returns to its original position in the lower half of the screen.

Finally, type in '2' (RETURN) to cause a shift in the dividing line between the two screen halves. For illustrative purposes only, the division is increased by six screen rows each time '2' is entered.

I hope that many would-be adventure programmers will be able to benefit from incorporation of this screen utility into their creations.

The easiest way of all to create an adequate screen display for an adventure is to clear the screen every time the player enters a new room, or enters a LOOK command (meaning look around). Thereafter, the room description is written to the blank screen, followed by any other messages and all other user commands. The screen is permitted to scroll in the usual way.

The clear-screen option is widely used in mostly amateur adventure programs, and is arguably sufficient for most purposes. It is surprising to observe that Level 9's adventures use a simple scrolling screen display without even the luxury of clearing the screen between locations. This presumably was due to the difficulty of arranging superior screen displays for the many different types of computer for which the adventures were sold. Similarly, my "MetMan" adventure, for which the listing was provided in the previous article, also had a simple, scrolling screen display in order not to obscure the principal adventure programming ideas with complications caused by the screen display.

PACKING MORE INTO THE ADVENTURE

There are two principal methods by which large amounts of screen information, such as messages, can be brought up onto the screen from a computer adventure.

The first requires data compression techniques, so that the screen messages occupy less space in memory. The second uses 'overlays' to load data into memory from a disk as required. Both types are discussed below.

DATA COMPRESSION

A large part of any adventure program comprises the long strings of room descriptions, help text and other messages. It would save a lot of computer memory if these messages could be made more compact.

The first, trivial, option is to shorten the screen messages. Whether lengthy room descriptions really add anything to an adventure is clearly a matter of personal preference. However, there is no doubt that verbose descriptions are subjectively more impressive to the player of an adventure.

A number of data compression techniques exist, but all rely essentially on one principle: the identification of common fragments of text which can be replaced by a shorter piece of code. When the program encounters the identifier, it uses a look-up table to restore the original, expanded piece of code.

Messages require very few characters. Eight-bit computers permit up to 256 variations for every character, but adventures need to use:

26 variations for letters A to Z
10 variations for numbers 0 to 9
approx. 10 variations for punctuation (space, comma, full stop, question mark, quotes, exclamation mark, hyphen.)
(optionally) 26 variations for letters a to z.

This means that at most 62 variations are used for messages, so that another 200-odd are available as "control codes". When encountered in the middle of a message, the program knows that it must take some additional action, such as replacing the control code with a section of text taken from a look-up table.

A short example will illustrate the basic idea. Consider these three messages:

```
I AM STANDING UNDERNEATH A WATERFALL
I AM STANDING IN A LARGE CAVERN WHERE I CAN HEAR
THE SOUND OF RUNNING WATER
A MAN-EATING TIGER STANDS BEFORE ME WITH SALIVA
RUNNING FROM ITS LIPS
```

A casual inspection shows that the recurring words STAND, I_AM_, RUNNING_ and WATER can all be replaced with codes, e.g.:

```
CTRL-A = "I_AM_", CTRL-B = "STAND"
CTRL-C = "RUNNING_", CTRL-D = "WATER"
```

Accordingly we can create the following compressed sentences:

```
[CTRL-A][CTRL-B]ING UNDERNEATH A [CTRL-D]FALL
[CTRL-A][CTRL-B]ING IN A LARGE CAVERN WHERE I CAN
HEAR THE SOUND OF [CTRL-C][CTRL-D]
A MAN-EATING TIGER [CTRL-B]S BEFORE ME WITH SALIVA
[CTRL-C]FROM ITS LIPS.
```

When the program encounters these control codes, easily

identified especially in machine code, the relevant words are inserted instead.

This process, which is called PACKING, does mean that every character of a message has to be read by the program to see whether any character needs to be replaced by an expanded item. It can be rather slow in Basic, and the procedure is best suited to machine code adventures, unless the messages are quite short.

The computer memory saved in the cases cited above is comparatively small, but there exists a related, much more general method of data compression known as Huffman coding.

HUFFMAN CODING

The underlying principle of Huffman coding is that all the accumulated screen messages are examined for common occurrences of clusters of characters by an automated process which seeks blocks of common text regardless of whether the blocks make sense of themselves. For example, a common block of code might be found to be M_STAN as in I AM STANDING... This computerised process provides a much greater degree of data compression than would have been possible by simple packing.

Huffman coding breaks down the text strings into a series of bit (as in 8-bit computer) sequences, each sequence representing a portion of text, and stores the bit sequences in memory without regard to the number of bytes used for each sequence. Inevitably, this technique will be of most value to machine code programmers. The code to create an automatic "Huffman Coder" is quite complex, and is beyond the scope of this article. A good overview was provided several years ago in the magazine "Practical Computing" (November, 1982).

The use of a word processor, such as AtariWriter, can be strongly recommended for handling strings of messages. You can then write a program in Basic to 'crunch' the text file into a coded, compressed variant (I do this frequently to create strings of book opening moves for computer chess programs). The compressed version is itself saved as a word-processor file, until it needs to be copied, byte by byte, into memory using another special Basic routine.

A further variant of data compression is available from the SpartaDOS-X cartridge, which has, among many other useful features, an archiving facility. The archiving program 'crunches' the original word processor file into an archive file of roughly half the original size - this indicates the type of space saving one should expect from efficient Huffman coding - and stores the whole file. It occurs to me as I write these words that it should be possible to use an archive file directly as a source of compressed message data, if one could only work out SpartaDOS-X's method of storing the archive file and its associated look-up tables.

A-CODE

Level 9's adventure programmers went one step further than Huffman coding. Instead of subjecting just the screen messages to data compression, they also reduced the whole of the original machine code, including the program itself, to a more compact code. The resulting program is said to run in 'A-code'.

Naturally, a short, normal (non-compressed) machine code program is needed to interpret the function of the remainder of the compressed machine code main program. It is possible to write 'A-code' since Level 9 observed that only a very limited set of machine code instructions was needed to implement a working adventure.

OVERLAYS

The second solution to the problem of presenting lengthy room descriptions for a large number of rooms is that of overlays. New data is entered into memory to overlay that which previously existed.

The principle is that when the player enters a room, the associated information for that room (and, perhaps, for the surrounding rooms) is read in from an external device. Typically the external device is a disk drive; in other words, the room data is stored on the program disk and called up as necessary.

The major advantage of this approach is that the computer's memory can be very largely devoted to the program itself, so that complex coding is made easier. Moreover, the amount of data which can be provided is limited only by the capacity of the disk, whereas data compression techniques at best do little more than double the amount of data which can be stored in the computer.

The principal disadvantage is the inconvenience to the user of having the disk drive switched on for hours at a time (causing over-heating), and the interval required to load the information each time a new room is entered. Some of the disadvantages can be averted by reading in data from a RAMdisk instead of from a disk drive, but this solution is only accessible to owners of the 130XE computer.

Overlays can also be used to call up high-res. graphics for pictures of events seen in the adventure. The combination of text adventures with periodic pictures - for example, every time a room is entered - has proved to be quite popular, although I suspect that the hundredth vision of a dragon in a room must get tiring; especially if the player has had to wait ten seconds each time to get it.

THE TURBO BASIC COMPILER

Turbo Basic is a public domain program available on disk for Atari XL/XE computers from, among others, New Atari User. A high-speed tape version is available from Derek Fern, provided that you have the necessary modification to your data recorder. It is completely compatible with Atari Basic programs, adds several new commands and runs about three times as fast.

Turbo Basic also comes with a compiler, which turns Turbo Basic programs into a rather inefficient machine code which runs about ten times faster than Atari Basic (optimised machine code can run 100-200 times as fast as Atari Basic). However, the compiler is not completely compatible with programs written in Atari Basic and Turbo Basic.

This lack of compatibility is by no means unusual. Many other compilers have difficulty with some Basic statements, and DataSoft's Basic compiler uses a completely different method of handling strings from Atari Basic. However, the Turbo Basic compiler is better than most.

Nevertheless, some alterations do have to be made to Turbo Basic programs to get proper results when the programs are compiled. This problem caused some of the strange coding in the "MetMan" adventure, which will be explained below.

The documentation for the Turbo Basic compiler comes from the Western New York Users' Group, and mentions only the following difficulties:

1. END and NEW commands will not compile.

2. FOR-NEXT loops must match, for example the lines:

```
FOR X = 1 TO 5
IF X = 3 THEN NEXT X
NEXT X
```

```
IL 1 REM ################################
IO 2 REM #     SPLIT SCREEN DISPLAY    #
OB 3 REM #          by John White      #
YT 4 REM # WRITING ADVENTURES SERIES #
XR 5 REM # -------------------------- #
RS 6 REM # NEW ATARI USER - AUG 1991 #
IR 7 REM ################################
NN 8 REM
ZE 100 REM ** TWO-HALF ADVENTURE SCREEN D
    ISPLAY **
MC 110 DIM A$(10):I=0
LB 120 CURS=84:REM ** CURS = CURSOR VERTI
    CAL POSITION **
MJ 130 VERT=6:REM ** SAMPLE VERTICAL DIVI
    DING LINE BETWEEN SCREENS **
TV 140 REM ** VERT MUST NOT BE <2 OR > 20
     **
TH 150 RESTORE 320
WP 160 READ A:IF A=-1 THEN 190
RJ 170 POKE 1536+I,A
VD 180 I=I+1:GOTO 160
FQ 190 IF VERT>20 THEN VERT=6
CY 195 GRAPHICS 0:GOSUB 270:POSITION 2,VE
    RT-1:? "==============================
    ====="
CV 200 POKE CURS,VERT
LN 210 INPUT A$:REM INPUT ANTHING YOU LIK
    E
CA 220 IF A$="0" THEN TEMP=PEEK(CURS):X=U
    SR(1536,0,VERT):GOSUB 270:POKE CURS,TE
    MP
ZM 230 IF A$="1" OR PEEK(CURS)>20 THEN X=
    USR(1536,1,VERT):POKE CURS,VERT
BX 240 IF A$="2" THEN VERT=VERT+6:GOTO 19
    0
MM 250 GOTO 210
AF 260 REM ** SHOW UPPER HALF OF SCREEN *
    *
LF 270 POSITION 2,0:? "THE ROOM DESCRIPTI
    ON WILL BE GIVEN HERE"
NU 280 POSITION 2,1:? " * * * * * * * * *
     * *"
XD 290 POSITION 2,2:? "CONTENTS OF ROOM W
    ILL BE LISTED HERE"
YZ 300 RETURN
CT 310 REM ** MACHINE CODE DATA **
DR 320 DATA 104,104,104,141,140,6,104,104
    ,141,141
XU 330 DATA 6,173,140,6,208,21,141,136,6,
    141
ZF 340 DATA 137,6,206,141,6,32,110,6,141,
    139
RC 350 DATA 6,140,138,6,76,56,6,32,110,6
QK 360 DATA 141,137,6,140,136,6,169,3,141
    ,139
GV 370 DATA 6,169,192,141,138,6,165,88,24
    ,109
BA 380 DATA 136,6,133,240,165,89,109,137,
    6,133
GV 390 DATA 241,165,88,24,109,138,6,133,2
    42,165
GN 400 DATA 89,109,139,6,133,243,169,0,16
    8,145
CC 410 DATA 240,230,240,208,2,230,241,166
    ,240,228
UN 420 DATA 242,208,242,166,241,228,243,2
    08,236,96
NK 430 DATA 169,0,141,140,6,162,8,78,141,
    6
FZ 440 DATA 144,3,24,105,40,106,110,140,6
    ,202
DZ 450 DATA 208,241,172,140,6,96,200,208,
    250,238
WE 460 DATA 135,6,202,208,244,24,96,0,0,0
GN 470 DATA -1
```

will not execute properly in the compiled program.

In the course of my own exploration of the Turbo Basic compiler, I have discovered a number of other cases where a program written in Atari Basic or Turbo Basic runs properly in normal (interpreted) Basic, but gives undefined errors when compiled.

1. VARIABLE GOSUB NOT ALLOWED

The expression:

100 Q= 1000: GOSUB Q

sends the program to the subroutine at line 1000 in Atari Basic or Turbo Basic. However, the version for the Turbo Basic compiler has to be recoded as:

100 Q = 1000: GOSUB 500
500 GOTO Q

where Q is the address of the subroutine as previously. This problem occurs in a few places in "MetMan", such as lines 50/200.

2. MULTIPLE ARRAY ARITHMETIC NOT IMPLEMENTED PROPERLY

The expression:

100 A(1,J) = A(1,J) + A(J,0)

gives an undefined result in the compiled version, and has to be replaced with:

100 Q = A(1,J): Q = Q + A(J,0)

3. ARRAYS BADLY NESTED WITH LOGICAL OPERATORS

Combinations of logical operators with array values work well in Atari Basic or Turbo Basic, but give unpredictable results with the Turbo Basic compiler. For example, the line:

100 IF A(1) <> TEMP AND (A(1)<>1 OR A(2)<>TEMP) THEN..

may or may not give the expected result, depending on the values of A(1), A(2) and TEMP, whereas the equivalent line:

100 A1 = A(1) : A2 = A(2) : IF A1 <> TEMP AND (A1<>1 OR A2<> TEMP) THEN ...

is implemented correctly by the compiler.

4. USR COMMAND RETURNS WRONG VALUE

The expression X=USR(1536) should return the value of X as 1536 if the machine code routine beginning at memory location 1536 (page 6) does not modify locations $D4 and $D5; otherwise it should return the value stored by the routine in $D4 and $D5 (low-byte, high-byte). This again is implemented properly for Atari Basic and Turbo Basic, but the compiler returns a strange value of its own to variable X (doubtless of some unknown significance).

The only solution to this problem is to cause the machine code routine to store values at defined memory locations, and then to extract them with a PEEK command. For an example, see lines 8000 and 8005 of the "MetMan" listing.

Notwithstanding these problems, there is no doubt that the Turbo Basic compiler is a considerable boon to the adventure writer. Compiled Basic programs run sufficiently fast so as to be almost indistinguishable from a 'proper' machine code adventure. Since Turbo Basic is in the public domain, it is likely that programmers can sell adventures created with the assistance of the compiler, including the runtime package needed to support the compiled program, although they must be careful not to sell Turbo Basic, its compiler or the runtime package itself. The programmer will be selling his adventure, not the means of using it.

CONCLUSION

I have now reached the end of this series about programming text adventures. I hope readers have enjoyed it, and I look forward to seeing your creations (published in this magazine?). Please note that I am unable to answer specific questions about solving other programmers' adventures - write to the Tipster instead.

THE A-Z OF GOLDEN (AND NOT SO GOLDEN) OLDIES continued

CONAN THE BARBARIAN ★★
plat Datasoft/U.S. Gold 1984 (t,d) mid

An eight-screen platform game with the emphasis on puzzle solving rather than jumping and dodging. 'Conan' suffers from a few bugs and a truly awful colour palette. On the plus side, the music is of a very high standard. Of Datasoft's trio of thinking man's platformers ('Goonies', Zorro' and 'Conan'), this one is the worst.

COSMIC TUNNELS ★★☆
arc Datamost/Databyte 1983/1986 (t,d) mid

A neat little blast 'em up, strong on music and sound effects. You travel through each cosmic tunnel (a primitive 3-D effect) and then dodge the aliens on the planets at the end of them. Graphics could have been better, but generally there is nothing to complain about. You'll probably find yourself saying 'One more go', even if it's just to hear the music on the high score table again.

THE KEY

Star Ratings:-

★	poor
★☆	poor/mediocre
★★	mediocre
★★☆	mediocre/good
★★★	good
★★★☆	good/excellent
★★★★	excellent

arc	arcade game
plat	platform game
sim	simulation
strat	strategy game
adv	text adventure
gr adv	text adventure with pictures
frp	fantasy role playing game
arc/adv	arcade game with puzzle solving/mapping etc.

(t)	game is available on tape
(d)	game is available on disk
(r)	game is available on ROM cartridge
bud	budget priced game (£1.99-£2.99)
mid	mid-priced game (£3.00-£8.99)
full	full priced game (£9.00+)
imp	game is (or was) only available on import from America
scarce	no price range available, because game is very difficult to get hold of

The price and format (tape, disk etc.) ranges quoted are intended as guidelines only. Games which were originally available on tape and disk can now be found on cartridge and vice-versa. This can also alter the price of the game in question.

THE COUNT ★★☆
(gr.) adv. Adv. International 1981/83 (t,d) bud/mid

This game is also available as a two-disk graphical adventure. You play the part of a Van Helsing like character and must dispose of Dracula while he is asleep at his castle. The puzzles and plot developments are nicely done, and the program's vocabulary is small but adequate. One of the better Scott Adams adventures.

CRUMBLE'S CRISIS ★★★
arc Red Rat 1987 (t,d) mid

Technically good, but not very original game in which you guide Crumble (with built in Jet Pack) through lots of nicely drawn locations in his search for six fuzzies that have escaped from the intergalactic zoo. It's one of those 'if you touch the walls it drains your energy' type of games. On the whole, it's far too difficult to complete but very pretty to look at.

CRYSTAL RAIDER ★★☆
arc Mastertronic 1986 (t) bud

An entertaining little quickie from the once prolific software house. You manoeuvre a little character through fifty screens, collecting jewels and avoiding nasties. What sets 'Crystal Raider' apart from a hundred other games of the same theme is the unique control method and the night time feature, when you can only see what is within the range of your torch.

CURSE OF CROWLEY MANOR ★☆
adv. Adv.International 1981 (t) scarce

Probably programmer Jym Pearson's best adventure, but that's not saying much. This one scores heavily with its Lovecraftian type atmosphere, but it has one of the worst parsers ever devised. For adventure addicts only!

CYTRON MASTERS ★★
strat Strategic Simulations 1982 (d) scarce

Weird, complex simulation of futuristic combat set in an arena. This one plays like a wargame in real time. Definitely not for arcade freaks, but a fairly interesting challenge for the strategists out there. Written by Dan Bunten, who later went on to program such Atari classics as 'M.U.L.E.' and 'Seven Cities of Gold'.

DAMBUSTERS ★★
arc Unknown (forgotten!)1984? (t) scarce

An arcade game, written in Basic about the bombing of the Ruhr dam in World War 2. The horizontal and vertical scrolling is done competently and the game itself is fairly addictive and challenging. No real long term interest though.

DAN STRIKES BACK ★★☆
plat English Software 1983 (t) scarce

The sequel to 'Diamonds'. This is a tricky little game in which you have to manoeuvre Dan to the bottom of a vertically scrolling screen. Nasties and traps abound, and it is all very well worked out.

DARK CRYSTAL, THE ★★☆
gr. adv Sierra On-Line 1982 (d) full

Graphical adventure based on the film of the same name. The bad news is that the graphics are artifacted (black and white on English T.V.'s). The good news is that if you liked the film you will probably like this. It takes up three double-sided disks (mainly data for the numerous pictures).

DARTS ★ ★ ☆
arc Thorn E.M.I. 1981 (r) mid

Graphics are a bit blocky in this early darts game, but on the whole it turns out to be quite entertaining, and contains some nice touches. Up to four people can try their hand at either 301, 501 or 1001. The screen shows a view of your player and a close up of his hand which you must guide over the board. A good family game.

DATASOFT BASIC COMPILER ★ ★ ☆
ut Datasoft 1983 (d) full



One of the first Basic compilers for the XL/XE. Briefly, what it does is turn your Basic programs into machine code and allows them to run much faster. This one can't be recommended nowadays though because of its 16K limitation on source code and more importantly because the brilliant 'Turbo Basic and Compiler' are available in the Public Domain for a fraction of the cost.

DAY AT THE RACES, A ★ ★
strat Anvil/Red Rat 1985/1986 (t) bud

A game about horse racing to bring out the punter in you? Well, only if you're a horse racing fanatic, because this game really fails to convey any genuine excitement. Each player backs a horse and then watches the race. The computer keeps a running total of money lost or won over the whole day's meeting. That's about it really.

DEATH RACE ★ ★
arc Atlantis Software 1987 (t) bud

Graphically okay, but this is still one of the least exciting of the multitude of car racing games available for the Atari. Sound effects are among the worst you'll ever hear. Still, at it's budget price, you may find it worth acquiring.

DECATHLON ★ ★ ☆
arc Activision/Firebird 1984/1987 (t) bud

The ultimate joystick wrecking game. Waggle your way through ten events (and possibly joysticks) in this reasonable athletics simulation. Graphics are good, but there is hardly any sound. Worth getting if you like this sort of thing.

DESMOND'S DUNGEON ★ ★ ☆
plat Creative Sparks 1986 (t) bud

It's up to you to help Desmond recover all the treasure from the chests and deposit it at the top of the screen. Watch out for the usual assortment of baddies, including a chap in a plane. Pretty good fun, with nice scrolling and sound effects. There are a lot worse buys for £1.99.

DESPATCH RIDER ★ ★ ☆
arc Mastertronic 1987 (t) bud

Graphics aren't tremendous in this 'race against time' time, but playability is. You must guide your despatch rider around the streets (shown in a view from above) and deliver as many parcels as you can. Watch out for skips and the street walls as these knock precious minutes off your time limit.

DIAMONDS ★ ★ ☆
plat English Software 1983 (t) bud

Quintessential platform game in which you must help Dan collect all the diamonds from each screen whilst avoiding a motley collection of nasties. Fast and furious action all the way. Not a brilliant game by any means, but 'Diamonds' has its own unique charm.

DIMENSION X ★ ★ ★
arc Synapse Software 1984 (t) scarce

An unusual 3-D game in which you have to shoot the evil Rigellian ships and navigate your way through tunnels. The checker board ground whizzes past as you move along, and the approach to a tunnel is a nice graphic effect (almost as good as 'Elektraglide'). All round good graphics and also imaginative use of the sound chip.

DISC HOPPER ★ ★
arc Red Rat 1987 (t,d) bud

As far as I know this game only appears on the 'Four Star Compilation Vol. 1' release. It's a highly unusual game which makes use of Graphics Mode 9, so be prepared for some chunky but very colourful graphics. I'm afraid the game itself isn't up to much. A pseudo 3-D effect gives the impression of depth to the screen as you jump from disc to disc whilst avoiding nasties.

DISK WIZARD 2 ★ ★ ★ ☆
ut C.A.P. Software 1984 (d) scarce

An invaluable utility for disk drive owners containing features like map disk, copy, display/alter contents of sectors, change file links, disassemble from sectors, drive speed and much more. If you can find it, buy it.

DIZZY DICE ★ ★ ★
arc Players Software 1987 (t,d) bud

There aren't that many fruit machine games for the XL/XE, but this is one of the best. There are four reels, hold and gamble features and a hi/lo dice game. Colour is used to good effect but the sound is just adequate.

DOMAIN OF THE UNDEAD ★ ★
arc Red Rat 1986 (t,d) mid

A 'Ghouls and Ghosts' clone from the once prolific Atari software house. This does not rate as one of their best however. Armed only with a cross and a missile weapon, you must first clear all the skeletons from a graveyard. Then it's onto another screen and more blasting and dodging. Graphics and sound are O.K. and the game rates pretty highly in the difficulty league.

DONKEY KONG ★ ★ ★
plat Atari 1983 (r) mid

'Donkey Kong' was one of the first platform games in the arcades and it translated pretty well onto computer. All of the main features of a good platform game are contained here (jumping obstacles, hitting your enemies, finding the best route across the screen etc.). Some graphically amusing moments are to be seen along the way. Good fun.

DRAGON RIDERS OF PERN ★ ★ ☆
strat Epyx 1983 (d) imp, scarce

A game based on the fantasy novels of Anne McCaffrey, which is unlike any other I have ever seen. It contains elements of role playing, bargaining, arcade action and diplomacy mixed together in a hodge-podge style. You have to make alliances with the other characters in the game to halt the invasion of the 'thread'. Game screens include a map, information about other characters and events, and an arcade thread-fighting sequence. Not without merit, but I wish the whole thing had gelled together better than it did.

compiled by Kirk Ruebottom

A-Z OF ATARI SOFTWARE

DRELBS ★ ★
arc Synapse Software 1983 (t,d) mid

A game which is almost impossible to describe. 'Drelbs' consists of two separate phases. In the first you try to rearrange a large grid into a set of squares whilst dodging nasties. In the second you must free all your friends by running over them and avoiding a different nasty. Sound effects and graphics are pretty good, but gameplay is to shallow (and too weird!) to lift this one from the realms of mediocrity.

DROPZONE ★ ★ ★ ★
arc U.S. Gold 1985 (t,d) mid

One of the all-time classic home computer games (written especially for the Atari incidentally). Author Archer McClean converted it to other machines, such as the Commodore 64, and things had to be slowed down considerably. It's a shoot 'em up where you have to hit the button very fast if you want to rack up a decent high score. Make sure you also have someone at the keyboard to operate your cloaking device and smart bombs. Scrolling, graphics and sound are astounding, and don't forget the firework death sequence.

DRUID ★ ★ ★ ☆
arc/adv. Firebird Software 1987 (t) mid

This is the game 'Gauntlet' should have been. 'Druid' is a thoroughly entertaining shoot 'em up with strategic elements. There is a variety of nasties to kill, a number of weapons and spells with which to do it, and a myriad of passages to explore in your quest for the exit to the next level. Possibly Firebird's best game for the XL/XE.

DUELLIN' DROIDS ★ ★
arc English Software 1982 (t) scarce

A bog standard shoot 'em up. You are in an arena and must kill robots which come at you from all directions, and at the same time rescue your friends. The game's graphics, made from a redefined character set, are pretty crude. Paranoia is likely to set in as the robots converge on you from all sides.

EARTH VIEWS ★ ★ ★
ut Antic Software 1984 (d) imp

This technically excellent program is worth acquiring if you have any interest in geography. Literally thousands of maps of the earth, in 2-D or 3-D, can be called up at the press of a key. Information concerning cities, rivers, mountains etc. can also be viewed. A 'game' using the maps was also included as an afterthought. The two colour graphics used throughout are fine and nicely detailed.

EASTERN FRONT ★ ★ ★
strat APX 1981 (t,r) full

In its time this was a 'tour de force' of design and programming. 'Eastern Front' is a wargame about the German invasion of Russia in World War II. Movement of units is completely joystick controlled and orders are very easy to input. The map can be scrolled in all directions. Factors include supply, reinforcements and weather. This home produced program surpasses many efforts from the acknowledged computer wargame experts, 'Strategic Simulations'.

EIDOLON, THE ★ ★ ★ ★
arc/adv. Lucasfilm/Activision 1986 (d) full

Aspiring Atari programmers should take a look at this technically brilliant program, a lesson in how to exploit the graphic capabilities of the 8-bit machine. The game has you travelling through 3-D caverns in search of jewels, monsters and fireballs. The monsters you meet are wonderfully animated, and you can actually see them following you through the caverns! Strategic elements, excellent graphics, sound and gameplay, make up an all-time classic.

ELEKTRAGLIDE ★ ★ ★ ☆
arc English Software 1985 (t,d) mid

Often exciting car racing game with a nice line in graphics and music. Your view is from the windscreen of your vehicle and you must complete the chosen course in a set time. Bouncing balls constantly come towards you and there are tunnels, forks in the road and pillars to be negotiated. The scenery whizzes past at a terrific rate. Difficult to master at first, but stick with it and you should find 'Elektraglide' a stimulating experience.

ENCHANTER ★ ★ ★ ☆
adv. Infocom 19-(d) full
85

Infocom set the standards by which all other text adventures were judged. In 'Enchanter' you play the part of an apprentice wizard and you are charged with defeating the evil Krull. Spells play an important part in this one (sometimes to humorous effect). As always, the Infocom parser is up to a high standard, and the puzzles to be solved are of the medium to difficult variety.

ENCOUNTER ★ ★ ★ ☆
arc Novagen 1984 (t,d) mid

Paul Woakes, later to write 'Mercenary' made his Atari debut with this one. Basically, it's a humdinger of a 3-D shoot 'em up, a bit like 'Battlezone' but with filled-in graphics. 'Encounter' offers 360 degree scrolling, first person perspectives, intelligent enemies, eerie sound effects and terrific gameplay. What more could you ask for?

ESCAPE FROM DOOMWORLD ★ ☆
arc Red Rat 1986 (t,d) bud

A fairly poor offering from the Red Rat. This looks like two bad games combined into one. The first part is a platform type game in which you collect things and dodge baddies. The second has you trying to rescue scientists, 'Choplifter' style in a horizontally scrolling shoot 'em up. Neither of the two ideas have been implemented very well. Avoid this one if you can.

ESCAPE FROM TRAAM ★
adv. Adv. International 1981 (t) scarce

Possibly the worst adventure I've ever played. 'Traam' is from the underworked keyboard of Jym Pearson, the man with the 20 word adventure vocabulary. This outing finds you crash landing on the planet of the title and trying to find a way back home. Trying to communicate with the program can be extremely frustrating to say the least.

EVEREST ★ ★ ☆
strat Titan Software 1983 (t) scarce

A fairly old and rarely seen text only simulation of a mountaineering expedition, written in Basic. You'll be called upon to make various decisions regarding climbers, porters, equipment and routes. Quite complex, involving and challenging.

EXCELSOR ★ ★ ☆
arc Players Software 1987 (t,d) bud

Another quickie from Players which, like most of their other games for the Atari, is very frugal in length of code. But for all that, it's colourful, noisy, and not a bad shoot 'em up. At the price, worth adding to your collection.

F-15 STRIKE EAGLE ★★★☆
sim Microprose 1984 (t,d) mid

Frightening in its realism, 'F-15' has you bombing, shooting and navigating your way over areas ranging from the Persian Gulf, Vietnam and Korea. Sound effects and graphics are very good and the speed of the game is impressive. There are lots of things to do, with keypresses controlling your weapons systems, radar, afterburners, speedbrakes, fuel tanks etc. Yes, it's all here. Microprose don't leave anything to the imagination.

FIDGET ★★
arc Americana/U.S. Gold 1986 (t,d) bud

A curious game, a sort of 'Marble Madness' derivative. The screen scrolls smoothly downwards as you move your little inertia-ridden character down ramps and platforms in his quest to reach the door to the next level. Nothing at all wrong with 'Fidget', but there's nothing outstanding either.

FIGHT NIGHT ★★★
arc U.S. Gold 1987 (t,d,r) mid

An amusing boxing game which took a long time to reach Britain after its initial release in America. You can either create and train your own boxer or choose one of the many provided to fight the likes of Hu Him, British Bulldog and Dipstick. The emphasis is on humour; there is only a limited amount of moves to employ. Best played as a two player game, as it is fairly easy to complete against the computer. Sound is pretty disappointing but graphics are quite good.

FIGHTER PILOT ★★★
sim Digital Integration 1985 (t,d) full

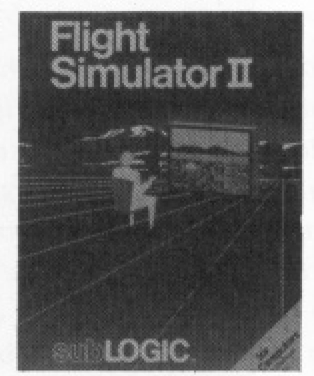
A complex, challenging flight simulator with all the features present that demanding buffs would expect. The only drawbacks are that it is very difficult to land the plane, and that the program uses the dreaded 'Lenslock' device as an anti-pirate measure. As with 'F-15 Strike Eagle' this is a simulation of flying an F-15 aircraft. For playability and realism, I think 'Strike Eagle' just has the edge.

FIREFLEET ★☆
arc English Software 1983 (t,d) scarce

A rather tacky and boring vertically scrolling shoot 'em up. This is a bit reminiscent of 'Caverns of Mars' as you blast your way slowly downwards, trying to reach the bottom of a cavern. Sound effects are unusual to say the least and the game is far too difficult to sustain any lasting interest. An early effort from English Software. They later went on to produce better games.

FLIGHT SIMULATOR 2 ★★★★
sim Sublogic 1984 (d,r) full

A huge, sprawling 'game' which has all the features any would-be aviator could wish for. Incredible detail and realism on the cockpit side of things, and the graphics (runways, rivers, buildings, roads etc.) are of a good standard. The whole scope of the program is unbelievable. Scenery areas are included for Chicago, New York, Los Angeles and Seattle, each with thousands of square miles to fly over. You can also buy additional scenery disks which cover other parts of America, Western Europe and Japan. A simulation in the truest sense of the word, so to get the most of 'FS2' requires reading of the detailed manuals which come with the package.



FLIP 'N FLOP ★★★
arc First Star Software 1983 (t,d) scarce

Nice graphics, smooth scrolling and good gameplay make this game a winner. You take the part of an escaped kangaroo and you dodge a keeper through screen after screen of ladders and suspended tiles. Every other round your role changes to that of a monkey (Flop), who climbs about underneath the ladders and tiles. Manoeuvring him can become quite tricky!

FLOYD OF THE JUNGLE ★☆
plat Microprose 1982 (d) scarce

Is this how Microprose started in business, writing forgettable platform games in Basic? Can this really be by the same flight/military simulation experts? All the platform cliches are here, namely running, jumping, punching pygmies (pygmies?) and avoiding nasties.

FORBIDDEN FOREST ★☆
arc Cosmi/Top Ten 1983/1987 (t) bud

A drab and uninteresting game in which you are an archer in a forest with all sorts of evil creatures to dispose of. You simply move the archer left and right, load his bow, aim and fire. I've seen better graphics on the old 2600 VCS. Cosmi strike out again I'm afraid.

FORT APOCALYPSE ★★☆
arc Synapse/U.S. Gold 1982/1985 (t,d) bud

An old reliable shoot 'em up, regarded by some as a minor classic of the genre. The old scenario of 'rescuing the hostages in your helicopter' is at least carried out with some flair here. 'Apocalypse' offers four-way scrolling, a barrage of loud and imaginative sound effects and challenging gameplay. Worth considering for the collec tion if you get off on shoot 'em ups.

FRENESIS ★
arc Mastertronic 1987 (t) bud

Mindless game from computer journalist Tony Takoushi. Aliens come at you from four quadrants and it's up to you to move your gun to the right quadrant and make sure it's moving in the right direction. That's all there is to it. The author should be congratulated upon writing a game for the XL/XE, but reprimanded for its quality.

FROGGER ★★☆
arc Sierra On-Line 1981 (t) scarce

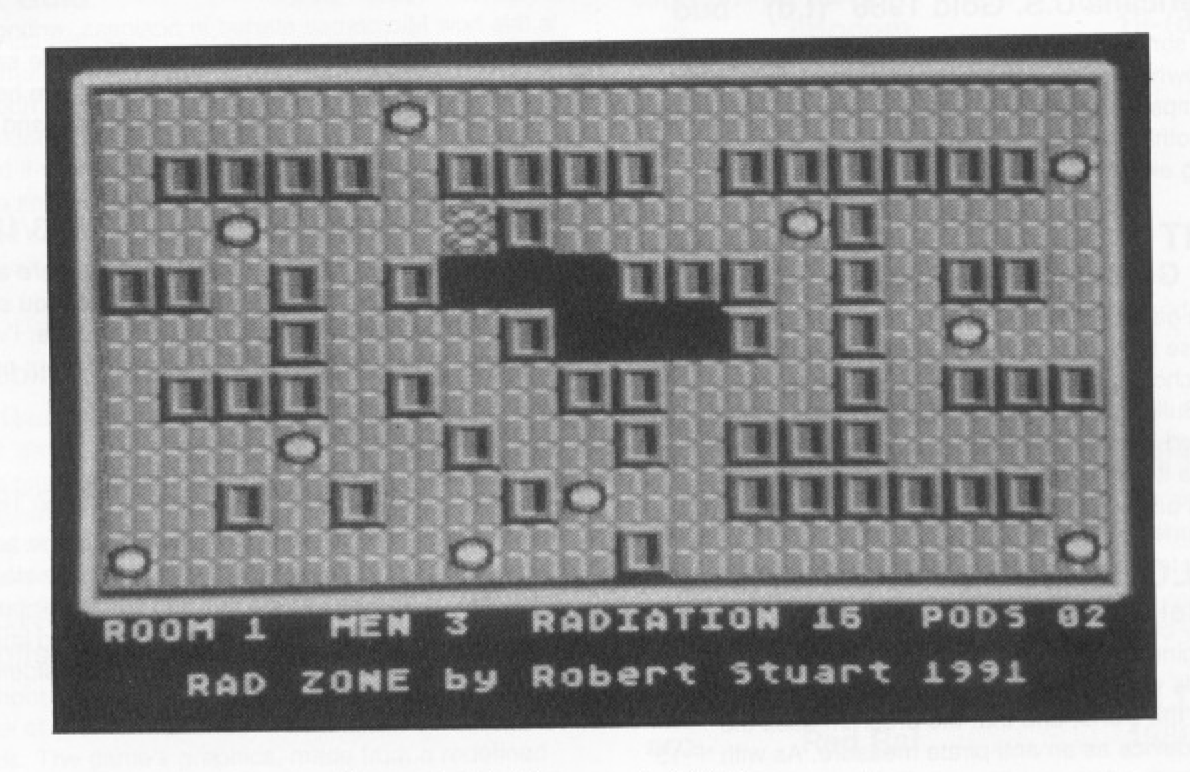
The ancient arcade favourite made its appearance on the Atari courtesy of today's 16-bit adventure specialists! They did a faithful and charming conversion. Graphics are bright and colourful and if you like your games simple and challenging at the same time then you could do a lot worse than buy 'Frogger'.

GAUNTLET ★★☆
arc U.S. Gold 1987 (t,d) mid

XL/XE 'Gauntlet' was one of the first versions to be promised and the last version to be delivered. The extra time the programmers had did not show in the quality of the finished effort. This could have been a lot better. There is still a terrific game in here however ('Gauntlet' was the biggest seller of '87). It's best played as a two player game, as you can co-operate in your battles through the dungeons. Really, it has little to do with role playing and a lot to do with shoot 'em ups. Addictive at first, but you may soon become bored with it.

To be Continued

RADZONE



by Robert Stuart

You are in control of a robot which has to remove twelve radioactive pods from six different zones. The robot has a shield which can withstand the radiation as long as it keeps moving; if you stop, the radiation will rapidly increase until it reaches 30 and then, BOOM! Also, the floor panels in the RAD ZONES have a nasty habit of sliding away after your droid moves off them, so each section of floor can only be used once! You have to work out a route to collect all of the pods without getting trapped in the RAD ZONE. You have another two droids in reserve, but remember you have to keep moving!

THE PROGRAM

The program is written in BASIC with a small machine code interrupt routine which is based on the sprite X/Y program in this issue. The routine has been modified slightly to use only two sprites (overlapped to achieve a three colour sprite), which saves typing in a lot of unnecessary data. The routine also uses only one pair of co-ordinates, to enable the multi-coloured sprite to be positioned using only two memory locations instead of four.

The other data is for a small Display List Interrupt to change the character set and character colours at the bottom of the screen, plus the new character set, which only uses forty characters. The standard set has not been moved from ROM, as there was no need; the DLI allows the ROM set to be used.

The strings A$ and B$ hold the characters for the metallic walls at the top and bottom of the screen. The rest of the screens are just printed to the screen while it is switched off to make it look more professional. These can easily be changed to different designs if you are feeling creative. You could even add more levels to the game. The variables used are as follows; M-Men left, P-Pods collected, R-Radiation level, S-Room number. So, if you find the game too tough, you can alter the Radiation level to go to 99 instead of 30. The first screen is straightforward, but the others get a little more tricky. I hope you enjoy it!

```
EX 1 REM ########################################
IP 2 REM #            RAD ZONE                  #
MD 3 REM #               by                     #
GD 4 REM #         Robert Stuart                #
HC 5 REM # ------------------------------------ #
NJ 6 REM #  NEW ATARI USER - AUG 1991           #
FD 7 REM ########################################
NN 8 REM
CW 9 REM NO NEED TO TYPE ANY OF THIS!!

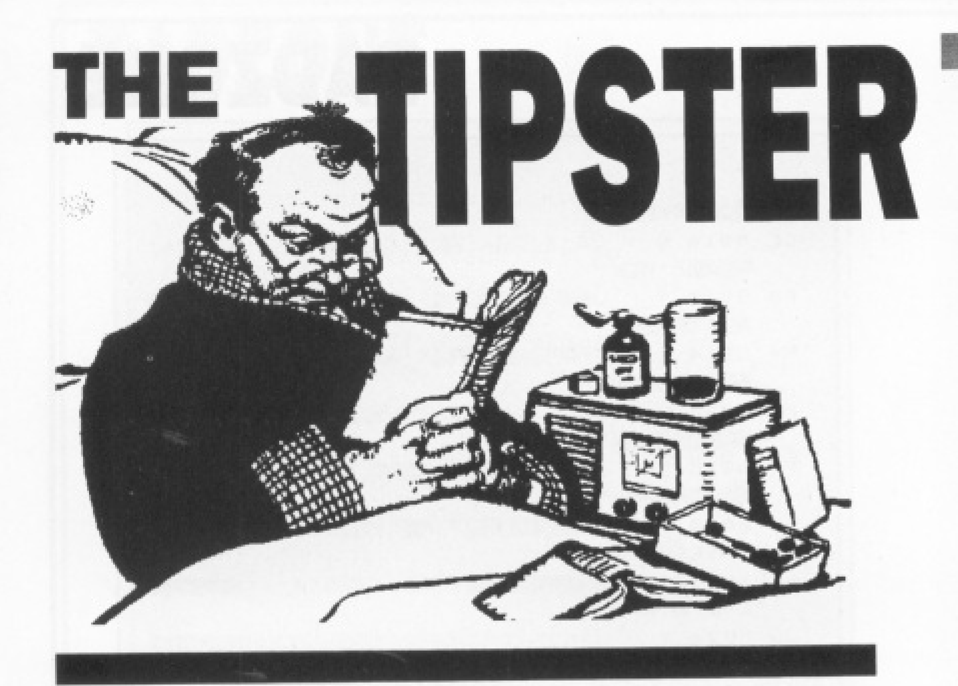

NH 0 POKE 559,0:DIM A$(39),B$(39):GOTO 30
GT 1 REM MOVE SPRITE
YN 2 FOR F=0 TO 7:Y=Y-2:POKE 1541,Y:NEXT
    F:GOSUB 10:Z=Z-80:RETURN
TB 4 FOR F=0 TO 7:Y=Y+2:POKE 1541,Y:NEXT
    F:GOSUB 10:Z=Z+80:RETURN
PN 6 FOR F=0 TO 7:X=X-1:POKE 1540,X:NEXT
    F:GOSUB 10:Z=Z-2:RETURN
KB 8 FOR F=0 TO 7:X=X+1:POKE 1540,X:NEXT
    F:GOSUB 10:Z=Z+2:RETURN
MZ 10 REM OPEN FLOOR
FA 12 FOR F=140 TO 160 STEP 4:POKE Z,F:PO
    KE Z+1,F+1:POKE Z+40,F+2:POKE Z+41,F+3
    :SOUND 0,F/10,8,2:NEXT F
JB 14 SOUND 0,0,0,0:POKE Z,0:POKE Z+1,0:P
    OKE Z+40,0:POKE Z+41,0:R=0:RETURN
VT 20 REM PICK UP POD
GW 22 P=P+1:FOR F=50 TO 0 STEP -5:SOUND 0
    ,F,10,12:NEXT F:SOUND 0,0,0,0:IF P>9 T
    HEN POSITION 36,20:? P;" "
RN 24 IF P<10 THEN POSITION 36,20:? "0";P
    ;" "
KU 26 POKE Z,140:POKE Z+1,141:POKE Z+40,1
    42:POKE Z+41,143:IF P=12 THEN S=S+1:P=
    0:GOTO 200
PD 28 GOTO 215
FQ 30 REM SPRITE X/Y INTERRUPT ROUTINE
NC 32 RESTORE 34:FOR F=30720 TO 30813:REA
    D D:POKE F,D:NEXT F
RL 34 DATA 172,1,6,162,0,169,0,153,32,124
    ,232,200,224,16,208,247
TB 36 DATA 172,1,6,162,0,169,0,153,32,125
    ,232,200,224,16,208,247
QV 38 DATA 162,0,189,4,6,157,0,6,232,224,
    4,208,245
TY 40 DATA 172,5,6,162,0,189,0,128,153,32
    ,124,232,200,224,16,208,244,173,4,6,14
    1,0,208
VW 42 DATA 172,5,6,162,0,189,16,128,153,3
    2,125,232,200,224,16,208,244,173,4,6,1
    41,1,208,76,98,228
PS 50 REM NEW CHARACTERS
ZD 52 RESTORE 54:FOR F=35872 TO 36192:REA
    D X:POKE F,X:NEXT F
GS 54 DATA 255,191,42,40,46,46,46,46,255,
    255,171,11,139,139,139,139,46,46,46,46
    ,47,42,0,0,139,139,139,139,235,171
HV 55 DATA 2,0,215,189,189,184,162,139,14
    1,197,215,189,189,45,137,225,113,83,19
    7,141,139,162,184,189,189,235,83
SH 56 DATA 113,225,137,45,189,189,235,215
    ,189,189,189,189,189,189,235,215,189,1
    89,189,189,189,189,235,189,189,189
LQ 57 DATA 189,189,189,189,235,215,189,18
    9,189,189,189,189,235,189,189,189,189,
    189,189,40,0,189,189,189,189,189
FP 58 DATA 189,40,0,0,20,189,189,189,189,
    189,189,0,20,189,189,189,189,189,189,1
    89,189,189
IV 59 DATA 189,189,40,0,0,189,189,189,189
    ,189,40,0,0,0,0,20,189,189,189,189,189
    ,0,0,20,189,189,189,189,189,189
JW 60 DATA 189,189,189,40,0,0,0,189,189,1
    89,189,40,0,0,0,0,0,0,20,189,189,189,1
    89,0,0,0,20,189,189,189,189,189,189
NC 61 DATA 189,40,0,0,0,0,189,189,189,40,
    0,0,0,0,0,0,0,20,189,189,189,0,0,0,0
    ,20,189,189,189,189,40,0,0,0,0,0,189
YU 62 DATA 40,0,0,0,0,0,0,0,0,0,0,0,20,
    189,0,0,0,0,0,20,189,10,47,181,149,1
    59,158,158,158,160,248,94,86,246,182
NT 63 DATA 182,182,158,158,158,159,149,18
    1,47,10,182,182,182,246,86,94,248,160,
    170,255,85,85,255,170,0,0,0,0,170
NW 64 DATA 255,85,85,255,170,158,158,158,
    158,158,158,158,158,182,182,182,182,18
    2,182,182,182,240
HC 70 REM SPRITE DATA
EF 72 RESTORE 74:FOR F=32768 TO 32783:REA
    D X:POKE F,X:NEXT F
MK 74 DATA 0,36,90,126,189,189,90,102,102
    ,90,189,189,126,90,36,0
NQ 76 RESTORE 78:FOR F=32784 TO 32799:REA
    D X:POKE F,X:NEXT F
YN 78 DATA 0,24,36,24,90,102,165,219,219,
    165,102,90,24,36,24,0
KB 80 REM DLI
EX 82 RESTORE 84:FOR F=1636 TO 1656:READ
    X:POKE F,X:NEXT F
UD 84 DATA 72,169,14,141,10,212,141,23,20
    8,169,0,141,24,208,169,224,141,9,212,1
    04,64
SQ 86 A$=" DHHHHHHHHHHHHHHHHHHHHHHHHHHHHH
    HHHHHHHE"
JG 88 B$=" FIIIIIIIIIIIIIIIIIIIIIIIIIIIII
    IIIIIIIG"
WB 90 REM TITLE PAGE
IG 92 GRAPHICS 0:POKE 16,64:POKE 53774,64
    :POKE 559,0:POKE 709,0:POKE 710,0:? "K
    ":POKE 752,1:POKE 756,224
ER 93 POKE 39978,6:POKE 39979,6:POSITION
    12,3:? "PAGE 6  PRESENTS"
IN 94 POSITION 6,5:? "rad zone":POSITION
    5,8:? "Written by Robert Stuart 1991"
HJ 95 POSITION 11,13:? "PRESS FIRE TO PLA
    Y"
PR 96 POKE 559,62:FOR F=0 TO 14 STEP 0.2:
    POKE 709,F:NEXT F
UN 97 IF PEEK(644)=0 THEN 99
SR 98 POKE 77,0:GOTO 97
JU 99 FOR F=14 TO 0 STEP -0.2:POKE 709,F:
    NEXT F
BD 100 REM NEW GAME
QQ 110 POKE 559,0:FOR F=39974 TO 39991:PO
    KE F,4:NEXT F:POKE 39971,68:POKE 39992
    ,132
UP 115 FOR F=39993 TO 39996:POKE F,2:NEXT
    F
ZD 120 POKE 82,0:POKE 708,14:POKE 710,8
NC 125 POKE 756,140:POKE 752,1:POKE 54279
    ,120
QV 130 POKE 54286,0:POKE 548,0:POKE 549,1
    20:POKE 512,100:POKE 513,6:POKE 54286,
    192:POKE 53277,3:POKE 623,33
DE 135 FOR F=1536 TO 1543:POKE F,0:NEXT F
BB 140 S=1:M=3:P=0:R=0
JD 200 REM NEXT LIFE
OZ 202 IF M=0 THEN GOTO 700
AX 204 IF S>6 THEN 600
JM 206 POKE 559,0:GOSUB S*1000
VL 207 POSITION 2,20:? "ROOM ";S;" "
BG 208 POSITION 10,20:? "MEN ";M;" "
OC 209 POSITION 31,20:? "PODS 0";P;" "
FX 210 POSITION 17,20:? "RADIATION 0";R;"
    "
XQ 212 POSITION 5,22:? "RAD ZONE by Rober
    t Stuart 1991"
YH 214 POKE 710,10:POKE 709,6:POKE 708,14
    :POKE 559,62
OZ 215 REM MAIN LOOP
```

continued ☛

RADZONE

```
UU 220 IF PEEK(632)=14 AND Y<>8 AND PEEK(Z-80)>127 THEN GOSUB 2
CV 222 IF PEEK(Z)=136 THEN 20
WS 224 IF PEEK(632)=13 AND Y<>136 AND PEEK(Z+80)>127 THEN GOSUB 4
DH 226 IF PEEK(Z)=136 THEN 20
CH 228 IF PEEK(632)=11 AND X<>56 AND PEEK(Z-2)>127 THEN GOSUB 6
CR 230 IF PEEK(Z)=136 THEN 20
DO 232 IF PEEK(632)=7 AND X<>192 AND PEEK(Z+2)>127 THEN GOSUB 8
DD 234 IF PEEK(Z)=136 THEN 20
KB 250 IF R>9 THEN POSITION 27,20:? R;" "
KU 260 IF R<10 THEN POSITION 27,20:? "0";R;" "
UZ 270 R=R+1:IF R>30 THEN 500
VR 300 POKE 77,0:GOTO 215
IB 500 REM LOST A LIFE
YF 510 GOSUB 10:FOR F=150 TO 10 STEP -4:SOUND 0,F,4,F/15:SOUND 1,F+100,8,F/15:NEXT F
MC 520 FOR F=14 TO 0 STEP -2:SOUND 0,F*100,12,F:POKE 704,F:POKE 705,F:NEXT F
PU 530 SOUND 0,0,0,0:SOUND 1,0,0,0:R=0:M=M-1:P=0:FOR F=1 TO 50:NEXT F
MC 540 GOTO 200
HP 600 REM COMPLETED!
SS 610 GRAPHICS 0:POKE 16,64:POKE 53774,64:POKE 559,0:POKE 1540,0:POKE 1541,0:POKE 709,0:POKE 710,0:? "K":POKE 752,1
GA 620 POSITION 9,6:? "WELL DONE CLEVER DICK!":POSITION 15,10:? "PRESS FIRE":POKE 756,224:POKE 559,62
UA 630 FOR F=0 TO 14 STEP 0.2:POKE 709,F:NEXT F
QU 640 IF PEEK(644)=0 THEN 660
XL 650 POKE 77,0:GOTO 640
DL 660 FOR F=14 TO 0 STEP -0.2:POKE 709,F:NEXT F:GOTO 70
GU 700 REM DEAD!
CV 710 POKE 1540,0:POKE 1541,0:GOTO 90
WM 999 REM LEVEL 1
AU 1000 ? "K":X=136:Y=72:POKE 82,0:POKE 704,54:POKE 705,58
SR 1001 POKE 711,184:POKE 1540,X:POKE 1541,Y:Z=40382:POSITION 0,0
CP 1002 ? A$
ZQ 1004 ? " J,-,-,-,-,-(),-,-,-,-,-,-,-,-,-,-,-,-K"
DG 1006 ? " J,-,-,-,-,-*+,-,-,-,-,-,-,-,-,-,-,-,-K"
OW 1008 ? " J,-$%$%$%$%,-$%$%$%$%,-$%$%$%$%$%$%()K"
ET 1010 ? " J,-&'&'&'&',-&'&'&'&',-&'&'&'&'&'&'*+K"
AB 1012 ? " J,-,-(),-,-,-()$%,-,-,-,-()$%,-,-,-,-K"
VN 1014 ? " J,-,-*+,-,-,-*+&',-,-,-,-*+&',-,-,-,-K"
WN 1016 ? " J$%$%,-$%,-$%,-,-()$%$%$%,-$%,-$%$%,-K"
SH 1018 ? " J&'&',-&',-&',-,-*+&'&'&',-&',-&'&',-K"
WM 1020 ? " J,-,-,-$%,-,-,-$%,-,-,-$%,-$%,-(),-,-K"
US 1022 ? " J,-,-,-&',-,-,-&',-,-,-&',-&',-*+,-,-K"
JG 1024 ? " J,-$%$%$%,-$%,-,-$%$%,-,-,-$%,-$%$%$%K"
CQ 1026 ? " J,-&'&'&',-&',-,-&'&',-,-,-&',-&'&'&'K"
XC 1028 ? " J,-,-,-(),-,-$%,-,-$%,-$%$%$%,-,-,-,-K"
XF 1030 ? " J,-,-,-*+,-,-&',-,-&',-&'&'&',-,-,-,-K"
QH 1032 ? " J,-,-$%,-$%,-,-$%(),-,-$%$%$%$%$%$%,-K"
NR 1034 ? " J,-,-&',-&',-,-&'*+,-,-&'&'&'&'&'&',-K"
LN 1036 ? " J(),-,-,-,-,-(),-,-$%,-,-,-,-,-,-,-()K"
CT 1038 ? " J*+,-,-,-,-,-*+,-,-&',-,-,-,-,-,-,-*+K"
DB 1040 ? B$
AO 1050 RETURN
QV 1999 REM LEVEL 2
CQ 2000 ? "K":X=56:Y=8:POKE 82,0:POKE 704,54:POKE 705,58
ZG 2001 POKE 711,88:POKE 1540,X:POKE 1541,Y:Z=40042:POSITION 0,0
CQ 2002 ? A$
PZ 2004 ? " J,-,-,-,-,-(),-,-,-,-,-,-$%$%,-,-,-,-K"
EV 2006 ? " J,-,-,-,-,-*+,-,-,-,-,-,-&'&',-,-,-,-K"
YJ 2008 ? " J$%,-$%,-$%$%,-$%,-$%$%,-,-,-,-$%$%,-K"
KC 2010 ? " J&',-&',-&'&',-&',-&'&',-,-,-,-&'&',-K"
PU 2012 ? " J$%(),-,-,-,-,-$%,-,-,-,-$%$%()$%$%()K"
JG 2014 ? " J&'*+,-,-,-,-,-&',-,-,-,-&'&'*+&'&'*+K"
RM 2016 ? " J$%$%$%,-$%,-,-,-()$%$%,-$%$%,-$%$%,-K"
PY 2018 ? " J&'&'&',-&',-,-,-*+&'&',-&'&',-&'&',-K"
GV 2020 ? " J,-(),-,-$%()$%$%,-$%$%,-,-(),-,-,-,-K"
MF 2022 ? " J,-*+,-,-&'*+&'&',-&'&',-,-*+,-,-,-,-K"
FH 2024 ? " J,-$%$%,-,-,-$%$%,-$%,-,-,-$%$%,-$%$%K"
VR 2026 ? " J,-&'&',-,-,-&'&',-&',-,-,-&'&',-&'&'K"
CZ 2028 ? " J,-$%$%$%$%,-$%$%()$%,-$%()$%$%,-$%$%K"
MM 2030 ? " J,-&'&'&'&',-&'&'*+&',-&'*+&'&',-&'&'K"
BG 2032 ? " J,-$%$%,-,-(),-,-,-,-,-$%,-$%$%,-$%$%K"
OA 2034 ? " J,-&'&',-,-*+,-,-,-,-,-&',-&'&',-&'&'K"
FO 2036 ? " J(),-,-,-$%$%$%,-,-,-$%$%,-,-,-,-$%$%K"
PG 2038 ? " J*+,-,-,-&'&'&',-,-,-&'&',-,-,-,-&'&'K"
DC 2040 ? B$
AP 2050 RETURN
RM 2999 REM LEVEL 3
RI 3000 ? "K":X=88:Y=56:POKE 82,0:POKE 704,54:POKE 705,58
IS 3001 POKE 711,120:POKE 1540,X:POKE 1541,Y:Z=40290:POSITION 0,0
CR 3002 ? A$
OM 3004 ? " J,-,-,-,-(),-,-,-,-$%$%(),-,-,-,-(),-K"
NA 3006 ? " J,-,-,-,-*+,-,-,-,-&'&'*+,-,-,-,-*+,-K"
JS 3008 ? " J,-$%,-$%,-$%$%$%,-,-$%,-$%,-$%$%$%,-K"
BR 3010 ? " J,-&',-&',-&'&'&',-,-&',-&',-&'&'&',-K"
EL 3012 ? " J,-$%,-,-,-,-,-,-$%,-$%,-,-,-$%,-,-,-K"
VZ 3014 ? " J,-&',-,-,-,-,-,-&',-&',-,-,-&',-,-,-K"
ML 3016 ? " J,-,-,-$%,-$%$%,-$%,-,-()$%,-$%()$%,-K"
EJ 3018 ? " J,-,-,-&',-&'&',-&',-,-*+&',-&'*+&',-K"
YC 3020 ? " J,-$%$%$%,-,-,-()$%$%$%,-$%,-
```

```
   $%[illegible]$%[illegible]K"
PI 3022 ? " J[illegible]&'&'&'[illegible]&'&'&'[illegible]&'[illegible]
   &'[illegible]&'[illegible]K"
JQ 3024 ? " J[illegible]$%[illegible]$%$%$%$%$%$%[illegible]$%[illegible]
   $%[illegible]$%[illegible]K"
FS 3026 ? " J[illegible]&'[illegible]&'&'&'&'&'&'[illegible]&'[illegible]
   &'[illegible]&'[illegible]K"
XU 3028 ? " J[illegible]$%[illegible]$%[illegible]
   [illegible]$%[illegible]K"
SL 3030 ? " J[illegible]&'[illegible]&'[illegible]
   [illegible]&'[illegible]K"
MN 3032 ? " J[illegible]$%[illegible]$%[illegible]$%$%[illegible]$%$%[illegible]$%$%$%
   $%$%$%[illegible]K"
UT 3034 ? " J[illegible]&'[illegible]&'[illegible]&'&'[illegible]&'&'[illegible]&'&'&'
   &'&'&'[illegible]K"
OR 3036 ? " J[illegible]$%$%[illegible]
   [illegible]K"
HT 3038 ? " J[illegible]&'&'[illegible]
   [illegible]K"
DD 3040 ? B$
AQ 3050 RETURN
SD 3999 REM LEVEL 4
OP 4000 ? "[illegible]":X=56:Y=56:POKE 82,0:POKE 70
   4,54:POKE 705,58
SJ 4001 POKE 711,168:POKE 1540,X:POKE 154
   1,Y:Z=40282:POSITION 0,0
CS 4002 ? A$
CZ 4004 ? " J[illegible]$%$%$%$%[illegible]
   [illegible]K"
BL 4006 ? " J[illegible]&'&'&'&'[illegible]
   [illegible]K"
SR 4008 ? " J[illegible]$%$%$%[illegible]$%[illegible]$%$%
   $%[illegible]$%[illegible]K"
GS 4010 ? " J[illegible]&'&'&'[illegible]&'[illegible]&'&'
   &'[illegible]&'[illegible]K"
CA 4012 ? " J[illegible]$%[illegible]$%$%$%$%[illegible]
   [illegible]$%[illegible]K"
FQ 4014 ? " J[illegible]&'[illegible]&'&'&'&'[illegible]
   [illegible]&'[illegible]K"
ZK 4016 ? " J[illegible]$%[illegible]$%[illegible]$%[illegible]$%$%$%[illegible]
   $%[illegible]$%[illegible]K"
OG 4018 ? " J[illegible]&'[illegible]&'[illegible]&'[illegible]&'&'&'[illegible]
   &'[illegible]&'[illegible]K"
ZB 4020 ? " J[illegible]$%[illegible]$%[illegible]$%[illegible]
   $%[illegible]$%[illegible]K"
WP 4022 ? " J[illegible]&'[illegible]&'[illegible]&'[illegible]
   &'[illegible]&'[illegible]K"
MD 4024 ? " J[illegible]$%[illegible]$%$%[illegible]$%$%$%$%[illegible]
   $%[illegible]$%[illegible]K"
OZ 4026 ? " J[illegible]&'[illegible]&'&'[illegible]&'&'&'&'[illegible]
   &'[illegible]&'[illegible]K"
NR 4028 ? " J[illegible]$%$%$%$%[illegible]$%$%[illegible]
   $%[illegible]K"
UK 4030 ? " J[illegible]&'&'&'&'[illegible]&'&'[illegible]
   &'[illegible]K"
TQ 4032 ? " J[illegible]$%$%$%$%[illegible]$%$%[illegible]$%[illegible]
   $%$%$%[illegible]K"
MQ 4034 ? " J[illegible]&'&'&'&'[illegible]&'&'[illegible]&'[illegible]
   &'&'&'[illegible]K"
GW 4036 ? " J[illegible]$%[illegible]
   [illegible]K"
WA 4038 ? " J[illegible]&'[illegible]
   [illegible]K"
DE 4040 ? B$
AR 4050 RETURN
SU 4999 REM LEVEL 5
FP 5000 ? "[illegible]":X=168:Y=56:POKE 82,0:POKE 7
   04,54:POKE 705,58
PQ 5001 POKE 711,24:POKE 1540,X:POKE 1541
   ,Y:Z=40310:POSITION 0,0
CT 5002 ? A$
ZI 5004 ? " J$%$%[illegible]$%$%[illegible]$%$%
   $%[illegible]K"
MQ 5006 ? " J&'&'[illegible]&'&'[illegible]&'&'
   &'[illegible]K"
RQ 5008 ? " J$%$%[illegible]$%[illegible]$%$%[illegible]$%$%$%[illegible]$%
   [illegible]$%[illegible]K"
GL 5010 ? " J&'&'[illegible]&'[illegible]&'&'[illegible]&'&'&'[illegible]&'
   [illegible]&'[illegible]K"
PD 5012 ? " J[illegible]$%$%[illegible]$%[illegible]
   [illegible]$%[illegible]K"
MT 5014 ? " J[illegible]&'&'[illegible]&'[illegible]
   [illegible]&'[illegible]K"
FX 5016 ? " J[illegible]$%$%[illegible]$%[illegible]$%$%[illegible]$%[illegible]
   [illegible]K"
FV 5018 ? " J[illegible]&'&'[illegible]&'[illegible]&'&'[illegible]&'[illegible]
   [illegible]K"
TC 5020 ? " J[illegible]$%[illegible]$%[illegible]$%$%$%[illegible]
   $%$%$%$%K"
QE 5022 ? " J[illegible]&'[illegible]&'[illegible]&'&'&'[illegible]
   &'&'&'&'K"
JO 5024 ? " J$%$%[illegible]$%[illegible]
   [illegible]K"
WE 5026 ? " J&'&'[illegible]&'[illegible]
   [illegible]K"
DG 5028 ? " J$%$%[illegible]$%[illegible]$%[illegible]$%$%[illegible]$%[illegible]$%
   $%$%$%[illegible]K"
ZD 5030 ? " J&'&'[illegible]&'[illegible]&'[illegible]&'&'[illegible]&'[illegible]&'
   &'&'&'[illegible]K"
VR 5032 ? " J$%$%[illegible]$%$%[illegible]$%$%[illegible]$%[illegible]$%
   $%$%$%[illegible]K"
CB 5034 ? " J&'&'[illegible]&'&'[illegible]&'&'[illegible]&'[illegible]&'
   &'&'&'[illegible]K"
SL 5036 ? " J[illegible]$%$%[illegible]$%[illegible]
   [illegible]K"
RN 5038 ? " J[illegible]&'&'[illegible]&'[illegible]
   [illegible]K"
DF 5040 ? B$
AS 5050 RETURN
TL 5999 REM LEVEL 6
KO 6000 ? "[illegible]":X=120:Y=8:POKE 82,0:POKE 70
   4,54:POKE 705,58
JI 6001 POKE 711,56:POKE 1540,X:POKE 1541
   ,Y:Z=40058:POSITION 0,0
CU 6002 ? A$
DF 6004 ? " J$%[illegible]$%[illegible]$%$%$%$%[illegible]
   [illegible]K"
JP 6006 ? " J&'[illegible]&'[illegible]&'&'&'&'[illegible]
   [illegible]K"
PJ 6008 ? " J[illegible]$%$%[illegible]$%[illegible]$%[illegible]
   $%[illegible]$%[illegible]K"
BO 6010 ? " J[illegible]&'&'[illegible]&'[illegible]&'[illegible]
   &'[illegible]&'[illegible]K"
NM 6012 ? " J[illegible]$%$%[illegible]$%[illegible]$%$%$%$%$%$%
   $%[illegible]$%[illegible]K"
IS 6014 ? " J[illegible]&'&'[illegible]&'[illegible]&'&'&'&'&'
   &'[illegible]&'[illegible]K"
YO 6016 ? " J[illegible]$%$%[illegible]$%$%$%$%$%
   $%[illegible]K"
RY 6018 ? " J[illegible]&'&'[illegible]&'&'&'&'
   &'[illegible]K"
UR 6020 ? " J$%[illegible]$%[illegible]$%$%[illegible]$%[illegible]
   $%[illegible]$%[illegible]K"
BP 6022 ? " J&'[illegible]&'[illegible]&'&'[illegible]&'[illegible]
   &'[illegible]&'[illegible]K"
LH 6024 ? " J$%[illegible]$%[illegible]$%[illegible]$%$%$%$%[illegible]
   [illegible]$%[illegible]K"
YP 6026 ? " J&'[illegible]&'[illegible]&'[illegible]&'&'&'&'[illegible]
   [illegible]&'[illegible]K"
OB 6028 ? " J$%[illegible]$%[illegible]$%$%[illegible]$%[illegible]$%
   [illegible]$%$%[illegible]K"
WA 6030 ? " J&'[illegible]&'[illegible]&'&'[illegible]&'[illegible]&'
   [illegible]&'&'[illegible]K"
MU 6032 ? " J$%[illegible]$%$%$%$%$%$%[illegible]$%[illegible]$%[illegible]$%
   [illegible]$%$%[illegible]K"
KI 6034 ? " J&'[illegible]&'&'&'&'&'[illegible]&'[illegible]&'
   [illegible]&'&'[illegible]K"
TK 6036 ? " J$%[illegible]$%[illegible]
   [illegible]K"
TC 6038 ? " J&'[illegible]&'[illegible]
   [illegible]K"
DG 6040 ? B$
AT 6050 RETURN
```



BUSTING OUT ALL OVER!

Well this is a new issue and a new bout of the wickedly freshest tips and hints for all of those games that you're stuck on.

Well what have we got for you? What haven't we got! We've got the complete solution to LORDS OF TIME (perhaps if you tippers get your skates on and send me a solution and maps to PRICE OF MAJIK we could complete the Time and Majik series within three issues!). We have for your delectation and delight the maps to levels 1,2 and 3 of RUFF AND REDDY AND THE GREAT SPACE ADVENTURE (I'm sure they make up such long titles to make us writers lives hell!) and much more besides.

Right, let me show you around my little emporium of delights (a.k.a. The Little Shop of Horrors).

BOUNTY PERFICK!

From the perfick hop country of Ashford Kent comes a **BOUNTY BOB STRIKES BACK** tip from S. Young. In the game you start off with only three lives and a bonus life at 20,000 points. But if you press the **OPTION** key then you have four lives instead of three and you get a bonus life at 10,000 points instead of 20,000.

FRUIT PICKIN'

The next tip is from Mr. T. Jones of Gillingham who's been busy extracting obscene amounts of money from **ARCADE FRUIT MACHINE** by Zeppelin. He stumbled across a good cheat by accident. He's found that if you wanted a "HOLD" or "OPTION HOLD" then press SELECT to go to the menu then press START. Keep on doing this until you either get HOLDS, SUPER HOLDS or OPTION HOLDS, sometimes this works but sometimes it doesn't but 90% of the time it will, even on winning reels, so have a go and become a millionaire (well almost!)

AND THE WINNER IS ...

Trust the crazy Tipster to award this issue's prize to someone from overseas!
The HAND HELD COLOUR TV is winging its way over to H.W. Schorsy of The Netherlands. I've no idea whether it will work over there, it probably only picks up BBC and Mr. Schorsy will have to wander around holding his TV with a 30 foot high aerial sticking out of his rucksack!
This issue, due to the Editor's severe brain fade and inability to think of something exotic, we are back to

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so get them tip, hints, cheats, maps and cookies for The Tipster heading this way.

JUST FOR YOU KATIE!

In response to a plea by a very nice young lady, Katie Crook, who asked for help on **MINER 2049'er**, I am going to re-print a way to start on any level. Start the game and then find a 'safe' place on screen and type in the following: 213(space)782(space)6861 then press SHIFT and 1 to 0. 1=level 1, 0=level 10. Easy isn't it, I have included this tip because it seems that Katie can get further than I can without the password and so using this tip should make her a better games player.

KICK OFF!

O.K. now that the football season is over people start playing computer soccer and from Kevin Smith of Swanley comes a few tips for **KICK OFF** players.

The best tactics are either 4-4-2 or 4-3-4. When the opposition goalie picks the ball up, keep yourself just inside the area and exactly opposite the goalie. When he kicks the ball out it will bounce into your path and you'll get a free shot.

From deepest Dorset comes another nice tip for **KICK OFF** from Alastair Mooney. When playing the game against the computer pressing SELECT will quit the game. So if you press the SELECT key when you are in the lead it will take that score as the final score and you will have won! Alastair also recommends that you go to Diablos as the second level in ZYBEX as there are plenty of lives within easy reach of the start. I would agree with him whole-heartedly as this level has got me out of many sticky situations in my time playing this game.

A COUPLE OF QUICK 'UNS

Ghosthunter G. Goldsworth of Bridgend, Mid. Glamorgan has found a way of advancing to level 14 in SPOOKY CASTLE. You simply press Control J and you are advanced to level 14 and then you can finish the game. Also if you keep pressing J down then you can go to other screens in the game.

CALIFORNIAN RUNning is that much easier thanx to Steven Head of Willenhall. Choose the Ferrari and reach about 65-70 mph then all you have to do is move left and right. This should make it much easier to complete the various stages.

Lords Of Time

MORE TIPSTER OVER HERE

Right grab your sword, backpack and torch and venture with me and H.W. Schorsy of The Netherlands into the mythical past and exciting future of the lands of The Lords Of Time. As per usual I've typed the solution in backwards so that DAOL KSID = LOAD DISK

By the way this solution will work on the ST and 8-bit as does last issues Red Moon solution.

PERIOD 1: THE PRESENT

KOOL EREHW EHT HSALF EMAC MORF - EKAT SSALGRUOH - EKAT ERUTCIP - MAXE ERUTCIP - N - EKAT XOBHCTAM - EKAT ELDNAC - DNIW KCOLC - NI - PORD GNIHTYREVE - NRUT GOC 1 - HSUP MULUDNEP - TUO - W - W - NEPO ROOD - RETNE - EKAT RAEPS - PU - N - EKAT KCAPKCAB - RAEW TI - EKAT EPOR - HCRAES ELIP - EKAT RENEPO - S - W - EKAT ESAC - E - D - W - EKAT EMONORTEM - EKAT GNIKOOL SSALG - E - S - NEPO DRAOBPUC - EKAT DOOFTAC - N - NEPO ROOD - TUO - E - E - N - N - EKAT KCIP - EKAT SKNALP - S - S - NEPO ROOD - S - PORD ESAC - PORD DOOFTAC - PORD RENEPO - PORD RAEPS - PORD EMONORTEM - HSUP MULUDNEP - TUO - W - W - W - NEPO ROOD - W - W - NEPO ROOD - W - W - PU - N - EIT KSNALP - PORD SKNALP REVO MAERTS - W - EVIG GNIKOOL SSALG - E - EKAT KNALP - S - PU - E - WS - EKAT SYEK HTIW ENOTSEDOL - NEPO ROOD - NI - EKAT EXA - EKAT LEVOHS - NEPO ROOD - TUO - E - E - E - HCRAES EHCSROP - EKAT NACLORTEP - D - PORD GNIHTYREVE - EKAT EXA - HSUP MULUDNEP - TUO - W - W - NEPO ROOD - RETNE - W - NEPO ROOD - TUO - WN -EKAT NAIRELAV - ES - W - PU - S - EVAW NAIRELAV AT WOLLIW - TUC WOLLIW - EKAT PORDRAET - N - PU - E - NEPO ROOD - NI - E - NEPO ROOD - E - E - E - NEPO ROOD - S - PORD GNIHTYREVE - EKAT LEVOHS - HSUP MULUDNEP - TUO - W - W - NEPO ROOD - W - NEPO ROOD - TUO - WS - E - E - ENIMAXE PAEH - HCRAES PAEH - TAE MOORHSUM - KOOL - E - D

PERIOD 2 : ICE AGE

CARRY WITH YOU DURING THIS PERIOD: XOBHCTAM - NACLORTEP - KCASKCUR - ELDNAC

NRUT GOC 2 - HSUP MULUDNEP - TUO - N - N - N - THGIL HCTAM - THGIL ELDNAC - YTPME NAC - THGIL EHT LORTEP HTIW ELDNAC - KOOL DNUORA - EKAT KSUT - EKAT TAOC - TI RAEW - S - S - S - NEPO ROOD - S - PORD TUSK - EKAT RAEPS - EKAT RENEPO - EKAT NIT - NEPO NIT - PORD RENEPO - NRUT GOC 2 - HSUP MULUDNEP - TUO - EN - PU - PU - PU - NI - EVIG DOOFTAC - EKAT HTOOT - OUT - D - D - D - WS - S - S - NEPO ROOD - S - PORD GNIHTYREVE - EKAT HTOOT - NRUT GOC 1 - HSUP MULUDNEP - TUO - W - W - NEPO ROOD - NI - W - NEPO ROOD - TUO - WS - E - E - EVIG HTOOT - ON - SEY - E - D - PORD NIOC - EKAT KCIP - NRUT GOC 2 - HSUP MULUDNEP - TUO - EN - PU - PU - EKAT ENOB - PU - NI - S - TUOHS OT ELCICI - EKAT ELCICI - N - E - E - E - EVIG ENOB - E - TIH LLAW - S - EKAT ARBALEDNAC - N - W - S - PORD ELCICI - WN - WN - TIH EBUC - ES - ES - N - N - W - TUO - D - D - D - WS - S - S - NEPO ROOD - S

PERIOD 3 : STONE AGE

CARRY WITH YOU THIS PERIOD: RAEPS - YLFERIF - RAEW KCASKCUR

NRUT GOC 3 - HSUP MULUDNEP - TUO - E - E - W - W - W - W- W - EKAT RORRIM - EKAT SEVAEL - EVIG SEVAEL TO OTNORB - EVAW RORRIM OT OTNORB - S - E - PU - PU - NI - PORD RORRIM TXEN OT NEMEVAC - N - EKAT GGE - EN - EKAT BULC - WS - N - S - W - EKAT ELBBEP - S - EKAT TOP - N - E - ES - E - WORHT ELBBEP OT NOTELEKS - EKAT ELBBEP - ES - WORHT BULC OT NAMEVAC - S - YAS AKERUE - NI - YAS SEMAJ TTAW - NI - EKAT LEEHW - D

PERIOD 4: VIKING ERA

CARRY WITH YOU THIS PERIOD: YLFERIF - TAOC - LEVOHS - TELTNUAG

NRUT GOC 4 - HSUP MULUDNEP - TUO - N - EVIG TAOC OT DRAUG - S - ES - ES - ES - NI - EN - E - GID - GID - DAER TNEMHCRAP - W - WS - HSUP - ENOTS - W - W - W - W - PU - PU - E - NEPO TSEHC - YALP RUL - NI - EKAT (WHATEVER OBJECT WAS STOLEN) - LLUP ELDNAH

PERIOD 5: MIDDLE AGES

CARRY WITH YOU THIS PERIOD: LEVOHS - DROWS - TEGGUN - YLFERIF
WEAR: KCASKCUR

NRUT GOC 5 - HSUP MULUDNEP - TUO - N - DAER ENOTSELIM - EKAT ENOTSELIM - E - NEPO ROOD - NI - EVIG TEGGUN OT REDNETRAB - EKAT ELA - NEPO ROOD - TUO - E - E - E - EVIG ELA OT REGNESSEM - W - W - W - EN - E - E - E- EVIG DOOF OT NOGARD - SEY - EKAT WING - SSIK GORF - EVIG DROWS OT ECNIRP - S - NI - EKAT TELTNUAG - RAEW TI - ES - W - EKAT RUOMRA - RAEW TI - S - W - W - W - D - D - GID - GID - EKAT REFFOC - GID

PERIOD 6: TUDOR ERA

CARRY WITH YOU THIS PERIOD: KCASKCUR - YLFERIF - TELTNUAG

NRUT GOC 6 - HSUP MULUDNEP - TUO - N - W - S - EKAT NROH - EKAT STAEMTEEWS - N - E - E - S - EKAT LLEB - GNIR LLEB - PORD LLEB - EKAT SDRAC - ELFFUHS SDRAC - PORD SDRAC - EKAT REKOJ - EVIG REKOJ OT RETSEJ - N - W - PU - PU - PU - W - S - EKAT GUR - S - EVIG STAEMTEEWS OT EHT SGOD - NEPO NAMOTTO - HCRAES MANOTTO - EKAT NWORC - N - N - E - E - S - S - EKAT ETUL - N - N - W - D - YALP ETUL - E - W - S - E - S - D - KNIRD RETAW - LLIF NROH HTIW RETAW - N

PERIOD 7: FUTURE

CARRY WITH YOU THIS PERIOD: KCASKCUR - YLFERIF - NIOC
WEAR: TELTNUAG

NRUT GOC 7 - HSUP MULUDNEP - TUO - W - W - YAP NIOC - E - N - PU - PU -TEG RATS - D - D - S - E - E - N - N - NEPO ROOD - N - W - EKAT DLAREME - E - N - EKAT SSERTTAM - EKAT TEKCOR - S - NEPO ROOD - S - S - S - E - D - S - E - EKAT ERBAS - W - S - NEPO ROOD - W - EKAT SSALG LAIHP - NEPO ROOD - ERIF TEKCOR - NI - YAP TAORG - NI - D - TEG YBUR - PU - TUO - N - E - THGIF NAMREBYC HTIW ERBASTHGIL - E - HCRAES HCNEBKROW - EKAT REVIRDWERCS - W - NEPO ROOD - KOOL NI TOBOR - EKAT PIHC - S - NI - D - D

PERIOD 8: ROMAN TIMES

CARRY WITH YOU THIS PERIOD: NROH - YLFERIF - KCASKCUR
WEAR: TELTNUAG

NRUT GOC 8 - HSUP MULUDNEP - TUO - N - N - N - N - EKAT ELKCUB - S - S - S - W - NI - LEENK - YARP - RAEW SLADNAS - E - E - EN - E - NI -TEG TEN - TEG TNEDIRT - TUO - W - WS - S - S - NI - WORHT TEN OT NOIL - WORHT TNEDIRT OT TEN - EKAT ELKCUB - NEPO ROOD - E - E - N - EN - EN - EN - S - KNIRD RETAW - LLUP ETARG - N - LLIF NROH HTIW RETAW - S - S - S- W - KNIRD RETAW - W - W - S

PERIOD 9: THE FAR FUTURE

CARRY WITH YOU THIS PERIOD: YLFERIF - LEVOHS - ELIVO HCNARB - NEDLOG ELKCUB - RETSEJ PAC - NOCILIS PIHC - A DNOMAID PORDRAET - YROVI KSUT - SNOGARD GNIW - GGE RAUSONID - ENOTSELIM - SYEK
WEAR: KCASKCUR

NRUT GOC 9 - HSUP MULUDNEP - TUO - S - PORD ENOTSELIM - S - S - S - D - W - S - GID ELTTOB - TEG ELTTOB - N - E - S - NEPO SEGAC - S - NEPO SRAB - TEG EYE - N - EN - E - NI - D - D - PORD ELTTOB - E - E - PU - PU - PU - EKAT KAOLC - NEPO ROOD - PU - RAEW KAOLC - E - (SEE BELOW BUT BEFORE YOU DO RAM SAVE YOUR POSITION SO THAT YOU CAN COME BACK OVER AND OVER AGAIN IF YOUR KILLED)
PORD EVILO HCNARB OTNI NORDLUAC
PORD YROVI KSUT OTNI NORDLUAC
PORD DNOMAID PORDRAET OTNI NORDLUAC
PORD NOCILIS PIHC OTNI NORDLUAC
PORD NEDLOG ELKCUB OTNI NORDLUAC
PORD LIVE EYE OTNI NORDLUAC
PORD RETSEJ PAC OTNI NORDLUAC
PORD NOGARD GNIW OTNI NORDLUAC

SNOITALUTARGNOC UOY EVAH TSUJ DETELPMOC SDROL FO EMIT

If you would like the maps to Lords of Time then send an S.A.E. or International Reply coupons if you are overseas to:-

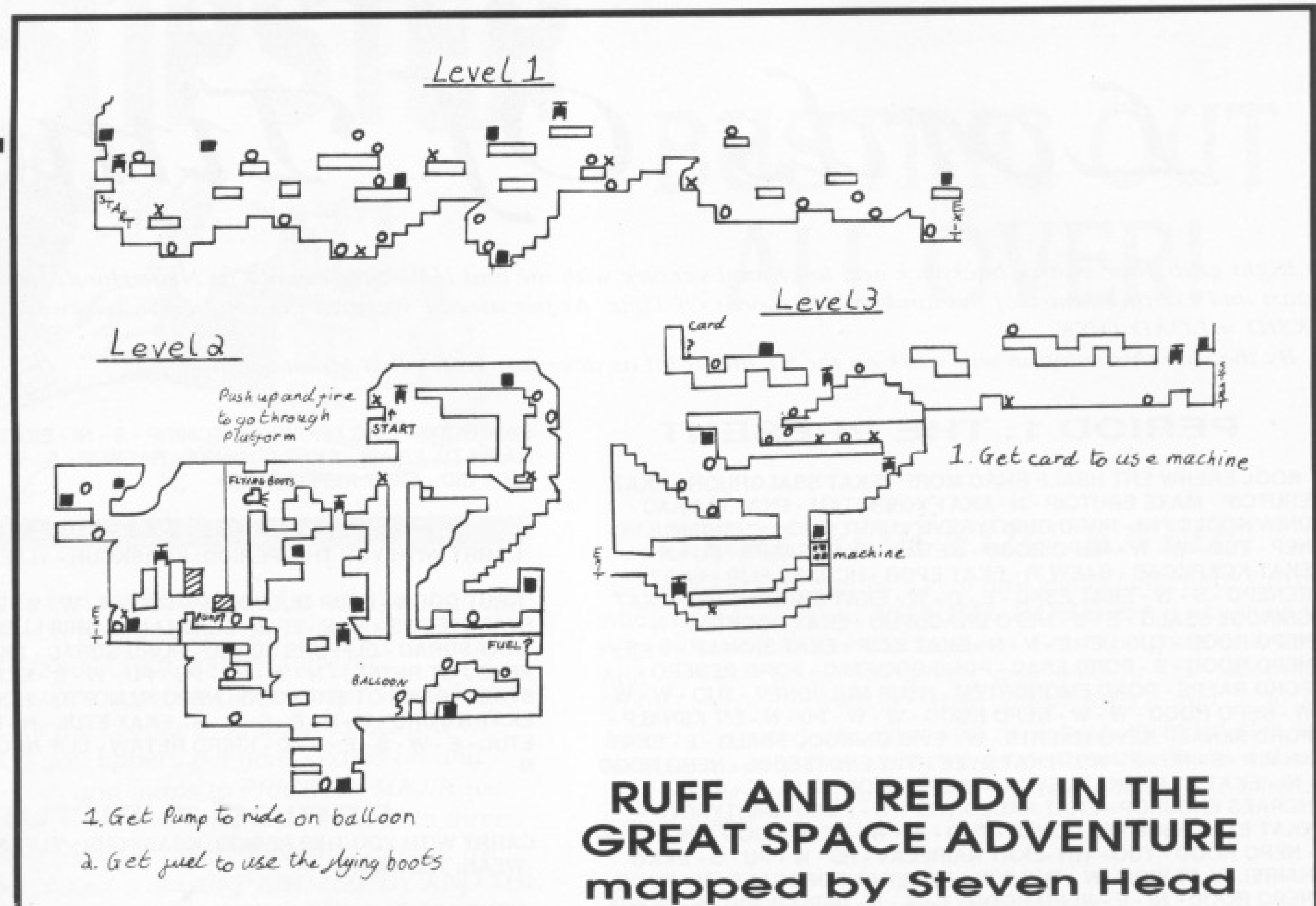
LORDS OF TIME MAPS
c/o 8, BYRON DRIVE
NEWPORT PAGNELL
BUCKS
MK16 8DX

and your maps will be sent to you post haste. (Joke, get it?)



COME ON THE GIRLS!

At last a tip written by young lady called Sue Donym of Gamesley (apt name!), Glossop. She says that if you want some more more money in LAS VEGAS CASINO then press HELP.



RUFF AND REDDY IN THE GREAT SPACE ADVENTURE
mapped by Steven Head

QUICK E's

Once again for the second issue running **BASIL THE GREAT MOUSE DETECTIVE** gets the expose treatment from non-other than Chris Day of Isaacs from down-under. He provides us with all the items that are needed to get to the other levels and some general hints on playing the game. Right grab your deer stalker and lets go!

Remember the shops have both front and back doors! Use the traps where you can't jump over the baddies. It helps if you can find the secret room on level 3.

Level 1: DAGGER, GUN, CIGAR, FLOWERS AND KEY
Level 2: BONE, HAT, CARD, TOOTH AND FRUIT
Level 3: LETTERS, PADLOCK, CANDLE, CIGAR AND FLOWERS

James Burnett of Ayrshire brings us a smattering of tips for four popular games.

*First off is **PERISCOPE UP** in which when you start off you are undamageable (does that word actually exist?) when flashing and so you can go straight through the wall.*

*Thundering round the track at 160 mph on the straights and taking the bends at 110 mph in **SPEED ACE** is what Jamie recommends. Oh yeah if you keep on the inside on the bends that also helps.*

*Go to the bottom of the screen and blast only the bad guys that come to your level in the **EXTIRPATOR**.*

Grab your pyjamas and cord and kick your way into **CHOP SUEY** from Ali Aftab of Slough. If you start off with a flying kick and then use the punch as often as possible then you win much easier.

Take Ali's tip for **WORLD SOCCER**, young man, and have only one midfield player as you can then concentrate all your attention on attack and defence. The SCOUT will say that you have a terrible midfield but over the seasons it will get better to that of average or good.

*From Basingstoke James Hunkin says that to gain the maximum number of points on the boulder stage of **JUNGLE HUNT** you have to keep in the middle of the screen as if you stay at the side you won't get any points for jumping the boulders!*

SOS....SOS....SOS....SOS

Andrew Kleanthaus is pulling his hair out trying to figure out **SNOWBALL** from Level 9. He is stuck because he keeps getting shot by a laser beam after climbing Jacobs ladder. He thinks he needs to find a portable laser but he's not sure. So dig out your maps and solutions and get writing.

Henry Knowles of Tonbridge Kent asks about **CLOAK OF DEATH**. To this I can say that if you look in issue 38 and 39 you will find the full and complete solution. I have to say this because otherwise I would be printing the same stuff over and over again because I get at least two letters an issue asking about this adventure! I may be a conscientiously green person but re-cycling tips isn't for me! If you haven't got a copy of the mentioned issues then there are still copies available. Details are elsewhere in this issue.

Even though H.W. Schorsy has sent us a huge amount of help with Lords of Time he needs help as well on **ENCHANTER**. He is stuck after only a few moves when he gets to a location which says "The ground here is higher than to the South ...." and then can't get any further. Any idea?

Kevin Smith wants to know if there is any way of beating the world champion boxer in **KING OF THE RING**. If so, what training and between round comments have to be used. He also wants to know if there is a cheat for **DOMAIN OF THE DEAD**.

One last thing before I go, and that is please don't send me any more Transdisk information as I have compiled a table of some 309 different games that is available to registered Transdisk users. When I do an update to this I'll ask for your invaluable help once again.

So until the next time our paths cross and I'll once again pick up the gauntlet to battle by your side through the adversities of the latest mind numbing problems,

GOOOOOOOOOOOOOODDDDDDBBBBBBBYYYYYYYEEEEEEEEE!!!

Send your hints, tips, maps, cheats etc. to
THE TIPSTER
NEW ATARI USER
P.O. BOX 54
STAFFORD
ST16 1DR

HOW TO GET NEW ATARI USER

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contact ... contact ... contact ... contact

FOR SALE

XL SYSTEM: 800XL, XF551 drive, tape deck, all in excellent condition. Many games on tape and disk, disks and box, joysticks and manual £175 o.n.o. Tel. 0923 (Watford) 670841. Buyer collects.

XE SYSTEM: XE VGS, XC12 data recorder, 1029 printer, 27 cassette games, 3 cartridge, light gun, joystick, two books, mags, manuals. NO SPLITS. £180 o.n.o. Contact A. Gilbey, 1, Eastbrook Avenue, Dagenham, Essex, RM10 7UL. Buyer collects or pays postage.

800 SYSTEM: 800, Commodore 1701 colour monitor, 1050 disk drive with Happy backup fitted, XC12 data recorder, all leads, PSU's etc. paddles, mags, 350 disks, ValForth, 3 game ROMs, 3 language ROMs, lotsa books inc. Mapping The Atari plus 130XE, faulty keyboard, otherwise okay. OFFERS? Phone Brighton (0273) 553443 for details.

XE SYSTEM: XE system and cassette drive with over £70 worth of games inc. FS2 (ROM) and others plus joysticks and green monitor (no sound) and some New Atari User mags. Sell for £120 o.n.o. Phone Richard before 6pm on 081 441 2666. Edgware, Middx. area.

XL SYSTEM: 800XL, 1050 disk drive, 1010 cassette, Centronics interface, all leads, manuals, joystick and over £600 of original quality software and books. £230 ovno. Will not split. Tel. (Bucks) 0628 484824

SELL/SWAP: STFM 1 Meg ram, 1 Meg drive, 65 disks in box (games, PD, utilities), mouse mat, £330 ovno or swap for 800XL or 130XE, disk drive (fitted with US Doubler), cassette recorder, games, utilities, mags, also Transdisk. All must be in good condition. Ring Mike on (0785) 714836 (Penkridge, Staffs) after 6pm.

XL SYSTEM: 800XL with Phonemark Datacorder, joysticks, all leads and manuals, excellent condition with over £200 of original software, £90 plus P&P. Also Mercenary + Second City £4, Slave Adventure Creator £7, Compute!'s Second Machine Language book £6, Basic Rev. C (no lock up) cartridge £4. Machine Code Tutor (tapes) £6. Phone David 031 337 1641.

XL SYSTEM: 800XL, 1050 disk drive and 1010 tape recorder plus 16 disks, 10 tapes and 5 cartridges, Transdisk IV. 800XL works OK but needs slight attention, hence £60 only. Phone Paul on 071 323 5726 7.30 am to 4 pm Mon - Fri only.

SIRIUS COMPUTER: For sale or exchange for Atari 800/ST Soft/Hardware - Sirius twin disk drive computer with integral green screen monitor and some software inc. Wordstar. Contact Barrie on Wisbech, Cambs. (0945) 860346.

PRINTER: 1027 Letter Quality printer plus AtariWriter software, £65. Tel. 0636 79850 (Newark, Notts.).

XE SYSTEM: 65XE, XC12 datacorder, joystick, £70 worth of games, all manuals and leads, all complete, 35 games, all in excellent condition. £95 o.n.o. Tel. (0795) 875343 after 4pm.

DAISY WHEEL PRINTER: Ricoh 1600S, fast excellent print, wide carriage, RS232 but complete with Atari interface with additional Centronics output, £95. Tel. (0625) 420782.

800 & XL SYSTEM: 800 (48k) and 800XL with 1050 disk drive, 410 and 1010 data recorders, all with dust covers. Touch tablet, two trackballs, joystick and speech synthesiser, all with correct cables and manuals. hundreds of games and utilities on ROM, disk and tape. Various manuals and all editions of PAGE 6 and ATARI USER from Issue 1 and disks from Issue 35 onwards. All items in excellent condition. Would prefer not to split, buyer collects or pays postage. £400 ono. Phone Gary on 091 454 3257 any time.

XL SYSTEM: 800XL computer, 1010 data recorder, 1050 disk drive, all in good condition, joystick. Over 550 games, utilities etc. Loads of useful magazines and books. All manuals and cables. Will sell everything for £250. Buyer must collect or pay for postage. Tel. (081) 851 6642 after 5 pm on weekdays, ask for Melanie. Must sell everything!!

XE SYSTEM: 65XE and XC12 cassette recorder with built-in high speed converter. Atari 1027 LQ printer with ink rollers (boxed), Atariwriter on cassette and £70 worth of software, joystick, all leads and manuals, few mags. All in immaculate condition, £200 or will swap for Atari 520ST and I will add up to £60. Tel. (0233) 628185 or write to Mr. Young, St. Helens, MillHill, Kingsnorth, Ashford, Kent, TN23 3EP

800XL SYSTEM: Atari 800XL with 1050 disk drive, all manuals and leads. Boxed as original and in first class condition, £130. Tel. Mark 051 339 9227 after 7pm.

XL SYSTEM: 800XL with 1050 disk drive, 850 interface, XC11 recorder and Shinwa CP80 9 pin printer (plus 3 new ribbons), all boxed and with all manuals together with a range of software which includes Superscript, Mini Office II, Solo Flight and lots of other utilities and games. Sell all for £185 ono. Tel. Bristol (0275) 857618.

XL SYSTEM: 800XL complete with 1010 cassette, leads etc. perfect order, £95. Tel. 0372 453733

UPGRADE: Memory expansion for 600XL from 16k up to 64k. This cartridge for £25. Write to Arnold Bontsema, Wibenaheerd 366, 9736 ND, Groningen, Holland

VIDEO CAMERA: Hitachi HV-720 with lens CCTV surveillance type, B/W 600 lines resolution, standard composite video output, 240v mains, immaculate picture (as new), ideal for digitiser, £60. Tel. 061 798 0456 after 7.30pm.

65XE SYSTEM: 65XE computer, XC12 data recorder, over 50 games, joystick and some magazines. Only £80. Tel. 051 531 0493, Merseyside.

MAGS & GAMES: PAGE 6 nos. 20 - 28, mint condition and 130XE machine code book plus 50+ original cassette games - offers. Simon Brownlee, 9 Canterbury Road, Farnborough, Hants.

XL SYSTEM: 800XL, 1010 recorder, books, manuals, leads, joystick and over £130 worth of software, everything in good condition. Only £135 o.n.o. buyer must collect. Write to Mr. D. Rothod, 22, Nevett Street, Preston, Lancs. PR1 4RB

XE SYSTEM: 130XE, 1050 disk drive, new and hardly used XC12, small amount of games software, £150. Tel. Halifax 350642

800 SYSTEM: 800 with 410 datacorder, Atari 1027 printer and ten original cassette games. One key on datacorder needs attention but machine works well. Buyer collects or pays postage. All for £75 or will separate. Tel. (0570) 422387 any time or write to A.L. Morris, Coed Ceirios, Forest Road, Lampeter, Dyfed, SA48 8AN

WANTED

MANUAL: Manual for 1050 disk drive or photocopy. Will pay postage. Trevor Bakewell, 3 Northville Court, St. Annes, Nottingham, NG3 4HZ

ANTIC: Can anyone help me acquire the Antic Music Processor and the AMS File Translator programs which appeared as bonus programs on the December 1988 Antic magazine disk? Also the Antic Music Processor, version 2.0 which was a disk bonus on the June 1989 Antic magazine disk. Please write to Len Lawson, 100 Barons Road, Bury St. Edmunds, Suffolk, IP33 2LY

FLIGHT SIMS: Does anybody have a copy of Infiltrator for sale for the Atari 800XL preferably on disk. Any other flight simulation programs also wanted. Phone 071 242 8404 ask for T. Vitale

MANUALS: Wanted by newcomer to XL/XE, user manuals for 800XL/XE, disk drive 1050. Any instructions for DOS and Transdisk IV. Please write to Bill, 15, Edinburgh Place, Leeds, LS12 3RQ or phone 796853

WANTED: A DOS 2.5 disk with manuals, also a XC12 data recorder in working order. Write to Jason L. Hibbert, 84 Chequers Close, Pontefract, West Yorkshire, WF8 2TE

OBSCURE SOFTWARE?: I am looking for the following 8-bit titles: Cloak and Dagger (based on the movie), Bounty Bob Strikes Back and Tycoon. I am willing to pay top prices for these titles. Please contact Sean LaBrecque, 2750 S. Durango 1075-36, Las Vegas, NV 89117, U.S.A.

NEWSROOM: Has anyone got volumes 1, 2 and 3 Newsroom clip art disks for sale? Phone or write to Les Taylor, 99 Bredon Road, Stourbridge, West Midlands, DY8 4LA. Tel. 0384 379575

BOUNDER: Help! Has anyone got a photocopy listing of an old Basic game called Bounder. This was in a very early issue of Atari User and I believe the programmer's name was Waddilove. If anyone out there has this the please contact me on 081 778 7060 after 7pm. (Tim). I will gladly pay up to £5 for this listing.

BRIK BAT: Brik Bat with Constructor on disk or cassette in exchange for any two issues of Atari User or £2.50 cash. Also the book Software For Your Atari XL to swap for 1 issue of Atari User or £1.25 cash. Write to Andy Little, Meadowcroft, Lumley Lane, Kirkby Fleetham, Northallerton, North Yorkshire, DL7 0SJ or phone (0609) 748455 any weekday between 3.35pm and 7.30pm.

COMMUNICATIONS: Comms freak wants any communication software for XL/XE particularly hard to get programs like Phone Man, War Games Autodialler, Find-Em, Teletalk, Phone-Phreak and Blue Box. Anything considered. Buy/swap. Also want Infocom adventures and Hayes compatible modem. Buy modem or swap for 1027 printer. I will need correct leads and interface for modem also. Write to Darren Gregory, 29 Ludlow Grove, Blackpool, Lancs. FY2 0PZ

MAGAZINES: ATARI USER back issues from 1/1 to 3/8 except 2/4 to 2/7. Software (disk only) Chicken Chase and Head Over Heels. write to Guerrier, J. Claude, 11 CH. des Amouroux, 13800 Istres, France.

BOOKS: Mapping The Atari, DOS Users Manual, printer suitable for 800XL with leads and power pack. Diggins, 15 Edinburgh Place, Leeds, LS12 3RQ. Tel. 0532 796853

FONT IV: Or descender ROM (with fitting instructions) for 1029 printer. Write to William Jackson, 63 Martin Street, Buckhaven, Leven, Fife, Scotland, KY8 1EP

WANTED: F15 Strike Eagle, Kennedy Approach, Solo Flight 2 on tape with instructions. Good prices paid. Write to James M. Lee, 4 Highlands, Taunton, Somerset, TA1 4HP

TOUCH TABLET: Atari Artist ROM and Touch Tablet wanted. Phone Peter 0203 691392

PENPALS

CONTACTS WANTED: I have a 130XE, 1050 disk drive and 1029 printer. I would like to hear from anyone interested in swapping hints, tips, ideas etc. All letters answered. Bernard Lally, 185 Broad Oak Road, Parr. St. Helens, Merseyside, WA9 2AQ. Tel. 0744 23465

HI!: Alex is calling to all Atari freaks. If you do believe that the Atari ST and XL are the best then write to me. Amiga is good, ST is better. Contact Alex Schiphouwer, Hugo De Grootstraat 51, 4206 ZD, Gorinchem, Holland

WANTED BADLY: Contact with person I sold my 130XE and all other bits to. This was 3 to 4 years ago. At the time you were living just off the A4 at Osterly. Just after this you got a job in Insurance. If you are reading this please contact me on 081 778 7060 after 7pm. (Tim).

GREETINGS: Hello! Greetings from the USA. I am 21 years old and an avid Atari 8-bit fan. I would like to talk to 8-bit users from across the sea. I would like to swap hints, tricks and programs. If you are interested in finding out what the 8-bit is like in the USA contact Sean LaBrecque, 2750 S. Durango 1075-36, Las Vegas, NV 89117, U.S.A.

PENPALS: I would like to hear from any XL/XE owners willing to swap any hints, tips etc. I have a 65XE. I have 39 games which I share with my brother. I will answer most letters. Contact David Rochester, 3 Keswick Drive, Ferry Friston, Castleford, West Yorkshire, WF10 2RD or Tel. 0977 519033

CONTACTS WANTED: I have a 130XE, 1050 drive and 1029 printer and would like to hear from anyone interested in swapping hints, tips, ideas etc. All letters answered. Contact Bernard Lally, 185 Broad Oak Road, Parr. St. Helens, Merseyside, WA9 2AQ. Tel. 0744 23465

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FOR SALE ... WANTED ... PEN PALS ... ADVICE ... HELP ...

MENU130

by Les Howarth

MENU130 is a program for the 130XE only which automatically runs a MENU whenever RESET is pressed

This program was originally submitted to ATARI USER as a 5 liner routine simply to run any program in D8: with the name 'MENU'. That was quite a long time ago and they never did publish it. I have since expanded the program to autorun on pressing RESET and run any chosen Basic program. The routine remains in memory and will run every time RESET is pressed.

BACK TO THE MENU

The 130XE menu will automatically save itself to DRIVE 8. After which it will display the disk directory from drive 1. Select a number and press RETURN to run a Basic program. While a program is running, you may press RESET and the menu will then autorun from D8: and display the index of any disk in drive 1. Basic programs don't need any modification to operate this menu, the RESET key is trapped to run any program in drive 8 which has the name of MENU.

The routine is stored in the last 46 bytes of page 6 so should be okay with the great majority of programs which use page 6. Just as long as it is never overwritten. It will not run any machine code programs but I'm sure readers could modify it to do so.

HOW IT WORKS

The real work is done by the routine on lines 860 to 940. Whenever the menu runs it will check if the routine is already there and if so will not re-write the code so saving a little time.

There is a DLI routine on lines 50 to 55 just to make a nicer screen. Whenever the index is loaded the screen will blank so that the DLI doesn't make the screen jump.

Selection of a program to run is by typing the number on the menu and pressing RETURN. To look at another index, put another disk in drive and either press START or RESET.
Lines 240 to 480 load the index and wait for choice.
Lines 500 to 780 check and run the selected program.

The only other requirements for successful use of this program are the RAMDISK.COM for drive 8 which should be on your boot copy of DOS and preferably an autorun on your boot disk to instal and run the Menu program automatically.

```
EX 1 REM ####################################
VZ 2 REM #        130XE RESET MENU          #
MD 3 REM #               by                 #
ZJ 4 REM #           Les Howarth            #
HC 5 REM # -------------------------------- #
NJ 6 REM #  NEW ATARI USER - AUG 1991       #
FD 7 REM ####################################
NN 8 REM
EA 20 POKE 842,12:SAVE "D8:MENU"
SK 40 DIM FILE$(704),R$(18),Q$(2),PROG$(1
   5),T$(11),DLI$(8)
OW 45 IF PEEK(1740)=72 THEN 60
ML 50 RESTORE 55:FOR I=0 TO 10:READ D:POK
   E 1740+I,D:NEXT I
TT 55 DATA 72,169,32,141,10,212,141,24,20
   8,104,64
TT 60 GRAPHICS 0:POKE 710,116
SY 80 DL=PEEK(560)+256*PEEK(561):POKE DL+
   8,130
XK 90 POKE 512,204:POKE 513,6:POKE 54286,
   192:POKE 559,0
HK 100 POSITION 0,0:? "┌──────────────────
   ─────────────────────┐"
TA 120 POSITION 0,1:? "|      SELECT NUMBER
    OF PROGRAM TO RUN    |"
PI 140 POSITION 0,2:? "|         OR PRESS STA
   RT FOR NEW INDEX       |"
UF 160 POSITION 0,3:? "└──────────────────
   ─────────────────────┘":POSITION 2,4
YR 180 IF PEEK(1756)<>162 THEN GOSUB 840
EJ 240 OPEN #1,6,0,"D:*.*":C=0:TRAP 420
RA 280 C=C+1:INPUT #1,R$:FILE$(LEN(FILE$)
   +1)=R$(3,13)
PA 300 IF R$(5,8)="FREE" THEN 420
FU 320 ? C;:IF C<10 THEN ? " ";
RO 340 ? R$(2,13):IF C=17 THEN 380
KI 350 IF C>33 THEN 420
PO 360 GOTO 280
QF 380 POKE 82,24:POSITION 24,4:GOTO 280
QU 420 POKE 82,2:POKE 559,34:C=C-1
MT 430 POKE 764,255:POSITION 2,22:? "CHOI
   CE ";
EH 440 IF PEEK(53279)=6 THEN CLOSE #1:RUN
SE 460 IF PEEK(764)<>255 THEN 500
OV 480 GOTO 440
IM 500 INPUT Q$:IF Q$(1,1)<"1" OR Q$(1,1)
   >"9" THEN 560
CO 520 Q=VAL(Q$):IF Q>C THEN 560
DU 530 IF FILE$(Q*11-2,Q*11)="SYS" THEN 5
   60
QQ 540 GOTO 580
LA 560 POSITION 9,22:? "      "
YZ 570 SOUND 0,180,12,8:FOR W=1 TO 50:NEX
   T W:SOUND 0,0,0,0:GOTO 430
ML 580 R$=FILE$(Q*11-10,Q*11):PROG$(1,2)=
   "D:"
BN 600 FOR I=1 TO 8:IF R$(I,I)=" " THEN I
   =8:GOTO 640
JS 620 PROG$(I+2,I+2)=R$(I,I)
GE 640 NEXT I
EO 660 PROG$(LEN(PROG$)+1)="."
LU 680 FOR I=9 TO 11:IF R$(I,I)=" " THEN
   I=11:GOTO 720
VI 700 PROG$(LEN(PROG$)+1)=R$(I,I)
GB 720 NEXT I
TS 740 GRAPHICS 17:POSITION 6,9:? #6;"RUN
   NING"
YM 760 POSITION 4,11:? #6;PROG$
AE 780 TRAP 800:RUN PROG$
HK 800 GRAPHICS 0:? :? "ERROR ";PEEK(195)
OB 820 END
YO 840 POKE 9,3:POKE 2,220:POKE 3,6
ZG 860 RESTORE 880:FOR I=0 TO 34:READ D:P
   OKE 1756+I,D:NEXT I:RETURN
TE 880 DATA 162,0,189,243,6,157,146,156
CM 900 DATA 232,224,12,208,245,169,13
VI 920 DATA 141,74,3,76,128,255,0,0
KO 940 DATA 50,53,46,2,36,24,26,45,37,46,
   53,2
```

PD and a PRINTER

by Dennis Fogerty

Recently the versatility of my 800XL was expanded with the addition of a Epson compatible printer. At first it was used mostly for listings and disk directories, etc., but I soon realised that my limited amount of software severely restricted it's use. And my pocket just wouldn't stretch to glitzy, expensive commercial programs.

It was while browsing through the PAGE 6 PUBLIC DOMAIN catalogue I realised what a wide range of non-expensive printer software was available; something that would keep me, computer and printer, occupied for some time.

START WITH LISTINGS

Probably the earliest need for hard copy is for listing programs - those that either don't run correctly or require modification to be more user friendly. Easy you say, just LIST to printer. Unfortunately, this results in 3 screen lines being printed on 1 line by the printer, and with all the Control characters which took ages to type are missing! **UTILITIES 3 (#20)** contains an excellent utility for Epson compatibles named **EPLISTER.BAS.** Not only does it include every detail in the listing but print-out is every bit as clear as it appears in a magazine. There is however, one snag - 3 screen lines, again, become 1 line on printout so presentation isn't anything like what you see on the screen or in a magazine. Confusion!

Fortunately, the initial part of the program is in Basic so the remedy is simple. Alter Line 151 to:-

```
151 IF LEN(A$)>38 THEN B$=A$(39):A$(39)=""
```

You will now have hard copy exactly as it appears in NEW ATARI USER, including all CONTROL/INVERSE/ESC characters.

Complete listings are not always the ultimate answer especially when modifying a program. Amongst that mass of characters on the page, where and what are the Variables that actually control the program? Finding them in a long listing can be worse than the proverbial needle. And don't you always miss some?

DISK #20 also has a small utility called **XREFUTIL.LST** which removes all the frustration from the job. Not only does it print all the Variables but also the Line Numbers where they appear. All done in a neat columnar form both practical and pleasing to look at.

UTILITIES 5 (#35) too, has a useful Search and Print utility named **DISKDUMP**. This is a disassembler which gets the bytes from disk and prints all Hex, Dec and Op codes to both screen and printer.

KEEPING TRACK

Few of us can claim to be truly methodical so the time eventually comes when an accumulation of disks with dozens of programs can cause problems. The result is endless searching for the particular one you want. **CATALOG (#11)** puts an end to all that. Iit not only creates a database of all filenames but provides sub-headings covering description, category, etc. Your whole library can be sorted under any one of those fields and scrolled on the screen. But it is the printout that really proves the program's value. Full details of every file under your choice of heading is printed with neat presentation then, after clipping the pages together, you have a professional looking catalogue of your disk library.

CATALOG does have a few limitations some of which are mentioned in the documentation. One not mentioned however, is the fact that it will not record an AUTORUN.SYS file, and everybody must have quite a number of these. Deletion of Line 375 from the listing will correct this and, when auto-cataloguing, allow a description of the AUTORUN.SYS file. When a disk is catalogued the program inserts a locked 1-sector identifier onto that disk. Any later programs added to the disk can be included by selecting "Redo" from the Menu.

It was in using "Redo" I found a bug in version 2.3; it just would not accept the command. The outcome was always "Error 5 at Line 6700". The listing, in Basic, only requires correction of Line 6700 to:-

```
6700 TRAP 240:OPEN #3,4,0,PC$:TRAP 40000:INPUT #3,IN$
```

but it still requires first going to DOS to delete the DISK.CAT identifier on every disk you want to re-catalogue. To avoid this hassle make further alterations to the CATALOG listing as follows:-

```
6708 ? "Insert Disk to Redo now":REM ADD THIS LINE AND
ENTER WORDS IN INVERSE
6720 XIO 36,#3,0,0,PC$:XIO
33,#3,0,0,PC$:B=1:B=1+1:GOTO 200
```

Now instead of having to manually delete the identifier the program does it automatically and reinstates it when re-catalogue is finished.

WORD PROCESSING

At home probably one of the most irksome chores for most of us is letter writing, whether business or personal. Now the computer, in conjunction with word processor and printer, makes that task more pleasurable.

TEXTPRO (DS#8) is a first-rate word processor. Although Public Domain it must surely knock spots off many a commercial program. I have only ever used TEXTPRO because it covers everything I need, so there is no point in my buying a £25-£50 word processor Admittedly it does not contain a spell checker but I think most scribes can manage without that.

Also on the disk is a massive 35 page manual but, although this in itself may sound daunting, the word processor is so

simple to use it's rarely necessary to refer to the manual. So, even if TEXTPRO is only needed for the odd letter, a cookery recipe, or even an article to NEW ATARI USER it must, in the long term, prove to be cheaper than pen and ink!

PRETTY PRINTING!

Of course, once having used a word processor you then begin to look around for software that will enhance your printed word. Look no further, because **DAISY DOT II (DS#21)** provides just that. This, too, has comprehensive documentation of 23 pages! Text and commands must be converted to a disk file so the program, together with a word processor, go hand in hand.

Altogether there are 15 different text fonts on the disk but, coupled with **DAISY DOT ACCESSORY DISK (DS#22)** there is a further choice of 32 fonts. If that doesn't satisfy your requirements an excellent Editor program is also on the disk with which you can modify existing fonts or even design your very own.

The final printout defies belief that anything so professional could be available in the Public Domain. Depending on your choice of the four Densities provided, your print can equal the best of typewriters. For anything longer than a few paragraphs fanfold paper is required, but it is possible to print on both sides of the paper by means of Page Select. First odd-numbered pages are printed then, turning over the paper, even-numbered pages are selected. Two-column printing, similar to magazine layout, is also available simply by formatting the text. This does, however, involve some hand manipulation of the paper feed.

PICTURES

I cannot leave the subject of DAISY DOT without mentioning that the disk also contains a marvellous graphics printer driver utility under the name of **BILLBOARD**, again fully documented. This will print a Graphics 7.5,8 or 9 picture, upright or sideways, to almost any size required, provided the file is in 62-sector format.

The picture in memory can be viewed at any time. Print choices range from regular to inverse with four types of Density; any width or height. Position can be centre, far left or far right on the paper. Having made a selection the menu then advises the amount of paper required and the time it will take to print!

Obviously the larger the printout the "grainier" its appearance. While it is possible with this program to produce "super-mega" posters it is rather impracticable. For example, the document mentions a 95ft x 100ft poster which will take 17,920 sheets of paper and over 1,592 hours to print - a total of 66 days. No wonder a pause/stop printing command is provided!

ART PROGRAMS

Many must have dabbled with graphic art programs in an attempt to produce their masterwork only to find many such programs leave a lot to be desired. This cannot be said about **PIXEL ARTIST DE-LUXE (#141)** which must equal, even out-rank, many commercial arts packages. Apart from the 4 colours available, which can be adjusted for Hue and Luminance, there is a massive selection of 16 patterns. Then, not only can you choose from 6 different sized brushes but also a fine or coarse Air Brush. The range of effects which are produced by switching between these choices is sheer magic. Joystick or graphics tablet can be used, separately or both together. Very useful for intricate designs.

I found one of its most useful features was the cursor variable speed control. This provides adjustment from a mere crawl to almost the speed of light! Full benefit from this can be gained when using the Zoom facility which magnifies a small portion of the screen some 8 times. The user decides which portion is selected and very fine detail can be touched in without great effort. All the usual features you expect in a graphics program are there, including Bend, which allows the curvature of a line in two places.

With your masterpiece saved to disk a printer driver is needed to transfer on to paper. After all, you can't hang your TV screen on the wall! The previously mentioned BILLBOARD does all that is required with 62-sector files, while **PICDUMP (#58)** handles both 62-sector and Koala/Micropainter files. It also supports a wide variety of printers. This particular dump allows a preview of the picture in various shades of grey and adjustment of those shades prior to printing. What you see is what you print.

FAMILY TREES

GENEALOGY (DS#29) is perhaps of more limited appeal, but nonetheless comprehensive. Providing one can trace family ancestors this disk provides a valuable database of lineage information. Most of us have the relevant information regarding our parents and once you have seen this in printed form it can then become almost an obsession to trace further back.

Menu driven, it presents information in 3 forms, i.e. Namefile, Pedigree and Family Groups. Obviously Namefile requires all relevant data on a particular name, with the neat provision of a section for inclusion of personal history. Also there are sections for data on parents, wife and children.

Pedigree prints ancestry in chart form similar to the familiar Family Tree with its branches. The program is designed for use with Gemini/Star printers but there is an option for Others. I found it worked well with a Citizen 120D, the boxes and branch lines being formed with the + sign. Printer codes can be adjusted as mentioned in the document but you need to be into machine code to do so. Finally, Family Group presents ancestry in a neat, easy to follow tabulated text form. Obviously all this is dependent on the relevant data being available in Namefile.

While printing takes place it is interesting to watch the filenames scroll on screen as the disk is searched in chronological order. A fascinating disk.

A FINAL BIT OF FUN

Finally, in a different vein, I can recommend **PAPER AIRPLANE MAKER (DS#26)** which allows you to print out paper airplanes. They really do fly! Although it's quite a serious program it makes good fun for young and old alike. Altogether there are 8 ready-made planes on the disk, American Air Force of course, and it only requires a single keypress to transfer them to printer. In addition the disk has a simple, but excellent drawing program. For those who dabble in aero design here is a chance to fly your very own paper Spitfire.

There is no room here to mention other printer programs in the PAGE 6 LIBRARY, but a few minutes browse through the catalogue will prove there are plenty more worth considering.

Ian Finlayson's

TUTORIAL TIME

DISPLAY LISTS REVISITED

I have had several items of mail recently on the subject of databases, and some of you have even sent database programs which are very good for their specific tasks. With this encouragement I was thinking of doing another article on the subject, but after consideration decided that the series of articles constructing the database for tape users was enough for the time being. If any of you want to air the subject further please write with a disk or tape and return postage and I will send you a copy of the database programs that others have written, and put you in touch with the authors. Meanwhile I will go on to the second most popular subject in the mail - graphics.

One enquiry that I have had many times over the years is about saving graphics screens to tape or disk for use later in other programs. It is a long time since I addressed this problem in one of the first articles I wrote for Page 6 back in Issue 20 so many of you will not have seen it! But before we try to load and save graphic screens it is important to have an understanding of how graphics are handled in the Atari and what the various graphics modes are like. For this issue I will restrict myself to the displayed text and pictures and the display list which controls them, then next time I will go on to talk about loading and saving screens.

OS MODE (# FOR DL)	BASIC GR. MODE	# OF PIXEL LINES	# OF COLS	MEMORY BYTES/. LINE	TEXT OR GRAPHIC
0					BLANK LINE
1					JUMP
2	0	8	2	40	TEXT
3		10	2	40	TEXT
4		8	4	40	TEXT
5		16	4	40	TEXT
6	1	8	5	20	TEXT
7	2	16	5	20	TEXT
8	3	8	4	10	PLOT
9	4	4	2	10	PLOT
10	5	4	4	20	PLOT
11	6	2	2	20	PLOT
12		1	2	20	PLOT
13	7	2	4	40	PLOT
14		1	4	40	PLOT
15	8	1	2	40	PLOT
16	2 BLANK LINES		80	6 BLANK LINES	
32	3 BLANK LINES		96	7 BLANK LINES	
48	4 BLANK LINES		112	8 BLANK LINES	
64	5 BLANK LINES		65	JUMP & WAIT	

TABLE 1

PIXEL LINES AND MODE LINES

Before going any further I will explain a bit about how the picture on the screen is made up. The Atari display is made up of 192 horizontal lines, these are pixel lines. Now in a normal GR.0 text screen the individual letters and numbers are each made up from an 8x8 matrix of pixels (including the spaces between the characters both horizontally and vertically). So you can see that in GR.0 a line of text, or mode line occupies 8 pixel lines. Different numbers of pixel lines are used to make up a mode line for different graphics modes. In the highest resolution, GR.8, one mode line is the same as a pixel line, and at the other end of the scale in GR.2 (double height text) there are 16 pixel lines in a mode line.

WHAT IS THE DISPLAY LIST?

Inside the 8 bit Atari computers is a microprocessor or "chip" called ANTIC, which takes data from the computers RAM memory and turns it into the display you see on the TV or monitor. The display list is the program which tells ANTIC what to do, so a different display list must be generated for each separate graphic mode. The name Display List is very apt as it is not a program like those you have seen in Basic, but more like a machine code program - just a list of numbers. When a GRAPHICS command is issued in a Basic program the appropriate display list is set up automatically, but not all graphics modes can be accessed in this way. Some can only be generated by directly putting the right numbers in the display list.

```
WO 1 REM ********************************
TZ 2 REM *       TUTORIAL TIME          *
AN 4 REM *       DISPLAY LIST I         *
XU 5 REM *             by               *
CO 6 REM *        Ian Finlayson         *
OG 7 REM *------------------------------*
VU 8 REM * NEW ATARI USER - AUG 1991    *
WW 9 REM ********************************
AY 10 REM
AV 1100 GRAPHICS 0
ZE 1110 DIM A$(1),M(212)
NH 1120 TRAP 40000:TRAP 1120:? "K":POSITI
   ON 1,5:? "WHICH GRAPHICS MODE WOULD YO
   U LIKE TO"
YH 1122 ? "SEE THE DISPLAY LIST FOR (0 -
   11);"
MA 1125 POKE 710,0
CH 1130 INPUT MODE
FB 1140 IF MODE>11 OR MODE<0 THEN 1165
PD 1150 GOTO 1220
AC 1165 ? "K":POKE 708,52
AN 1170 POSITION 1,5:? "MODES 0 TO 11 ONL
   Y":SOUND 0,120,8,8:FOR W=1 TO 500:NEXT
    W:SOUND 0,0,0,0
PA 1180 GOTO 1120
CS 1220 GRAPHICS MODE
NC 1230 NON=PEEK(559):POKE 559,0
YG 1240 J=0:DONE=0
VJ 1245 DL=PEEK(560)+256*PEEK(561)
SO 1247 J=J+1:DONE=DONE+1
XI 1250 M(J)=PEEK(DL+J-1):IF M(J)=65 THEN
    DONE=-2
TT 1252 IF DONE=0 THEN 1254
UL 1253 GOTO 1247
ML 1254 GRAPHICS 0:K=1:POKE 559,NON
NI 1260 ? "K":POSITION 8,0:? "DISPLAY LIS
   T FOR MODE ";MODE:POSITION 1,1:? "----
   ---------------------------------"
KE 1270 TOTAL=J:FOR J=2 TO 22
FM 1280 FOR I=1 TO 40 STEP 4
UI 1290 POSITION I,J:? M(K):K=K+1:IF K>TO
   TAL THEN 1310
WJ 1300 NEXT I:NEXT J
HD 1310 POSITION 2,23:? "WOULD YOU LIKE T
   O SEE ANOTHER ";:GOSUB 2000
NO 1320 IF KEY=ASC("Y") OR KEY=ASC("y") T
   HEN 1120
BA 1330 IF KEY=ASC("N") OR KEY=ASC("n") T
   HEN POKE 764,12:END
PD 1340 GOTO 1310
WN 2000 OPEN #1,4,0,"K:":GET #1,KEY:CLOSE
    #1:RETURN
```

```
WO 1 REM ********************************
PA 2 REM *        TUTORIAL TIME         *
SR 4 REM *       DISPLAY LIST II        *
XU 5 REM *             by               *
CO 6 REM *        Ian Finlayson         *
OG 7 REM *------------------------------*
VU 8 REM * NEW ATARI USER - AUG 1991    *
WW 9 REM ********************************
AY 10 REM
FO 99 REM *** GRAPHIS 0, DL SETUP    ***
          *** SET LEFT MARGIN TO ZERO***
QG 100 GRAPHICS 0:GOSUB 500:POKE 82,0
KH 109 REM ** SET UP COLOURS         ***
HO 110 SETCOLOR 2,9,2:SETCOLOR 4,9,2:SETC
   OLOR 1,0,10
RW 119 REM ** ENTER TEXT FOR DISPLAY ***
          *** ?#6; NOT USED AS COMPUTER*
          *** THINKS ALL IS IN GR.0  ***
RE 120 ? "**  WELCOME TO................
   ...**":REM LINE 1
ZE 122 ? " ******************";"  *   PRO
   GRAMME    *":REM LINES 2A AND 2B
CZ 123 ? " *   TITLE PAGE   *";"  *******
   ************":REM LINES 3A AND 3B
TZ 124 ? "  **
       **":REM LINE 4
DT 125 ? "  **      A TUTORIAL SUBROUTINE
       **":REM LINE 5
KI 126 ? "  **            FOR PAGE 6
       **":REM LINE 6
KQ 127 ? " ******************";"  * BY
            *":REM LINES 7A AND 7B
ZA 128 ? " * IAN FINLAYSON  *";"  *******
   ************":REM LINES 8A AND 8B
TO 129 ? "  **  MAY 1988
       **":REM LINE 8
JK 130 ? "  ******************--PRESS STAR
   T--****"
IL 199 REM ** IF START PRESSED EXIT   ***
EW 200 IF PEEK(53279)=6 THEN GRAPHICS 0:P
   OKE 82,2:? :? :? :? "    GR.0 RESETS T
   O A STANDARD DL":END
LT 210 GOTO 200
UO 499 REM ** SET UP DISPLAY LIST     ***
VH 500 POKE 559,0:DL=PEEK(560)+256*PEEK(5
   61)
GG 520 Z1=PEEK(DL+4):Z2=PEEK(DL+5):I=0
SO 540 READ A:IF A=0 THEN 600
XZ 550 POKE (DL+I),A
SQ 560 IF I=4 THEN POKE DL+4,Z1
VD 570 IF I=5 THEN POKE DL+5,Z2
WL 580 I=I+1:GOTO 540
EO 590 DATA 112,112,112,66,96,144,7,7,7,7
   ,2,2,2,7,7,7,7,2,2,65,32,156,0
XA 600 POKE 559,34:RETURN
```

Table 1 shows a list of what all the numbers mean. You can see the extra operating system (OS) graphics modes that are available which cannot be called from Basic. Table 2 is the short display list for graphics mode 2 (the shortest of all the display lists) commented to show what each number in the list means. I will run through it briefly.

The first three numbers (112) make 24 blank lines at the top of the screen. You can see at the top of your screen that there is quite a bit of black space. In some older TV sets part of the picture disappeared off the edges of the screen so these blank lines were used to push the picture down and ensure that the whole screen is displayed, regardless of the overscan.

Next comes the number 71. This must be thought of as 64+7. 64 is the LMS or Load Memory Scan instruction, and 7 is the OS value of the graphics mode we are in (see table). The LMS instruction means "start looking for the screen data at the location pointed to by the next two bytes". In this case the next two bytes are 112 and 158, they are in low byte, high byte order so the address they point to is 112+256x158 or memory location 40560. In the standard graphics modes the screen data follows directly above the display list just below the top of RAM as shown in the diagram.

The next nine 7s are the OS numbers for nine lines of GR.2. Why only nine? Because the tenth has already been defined earlier as part of the LMS byte.

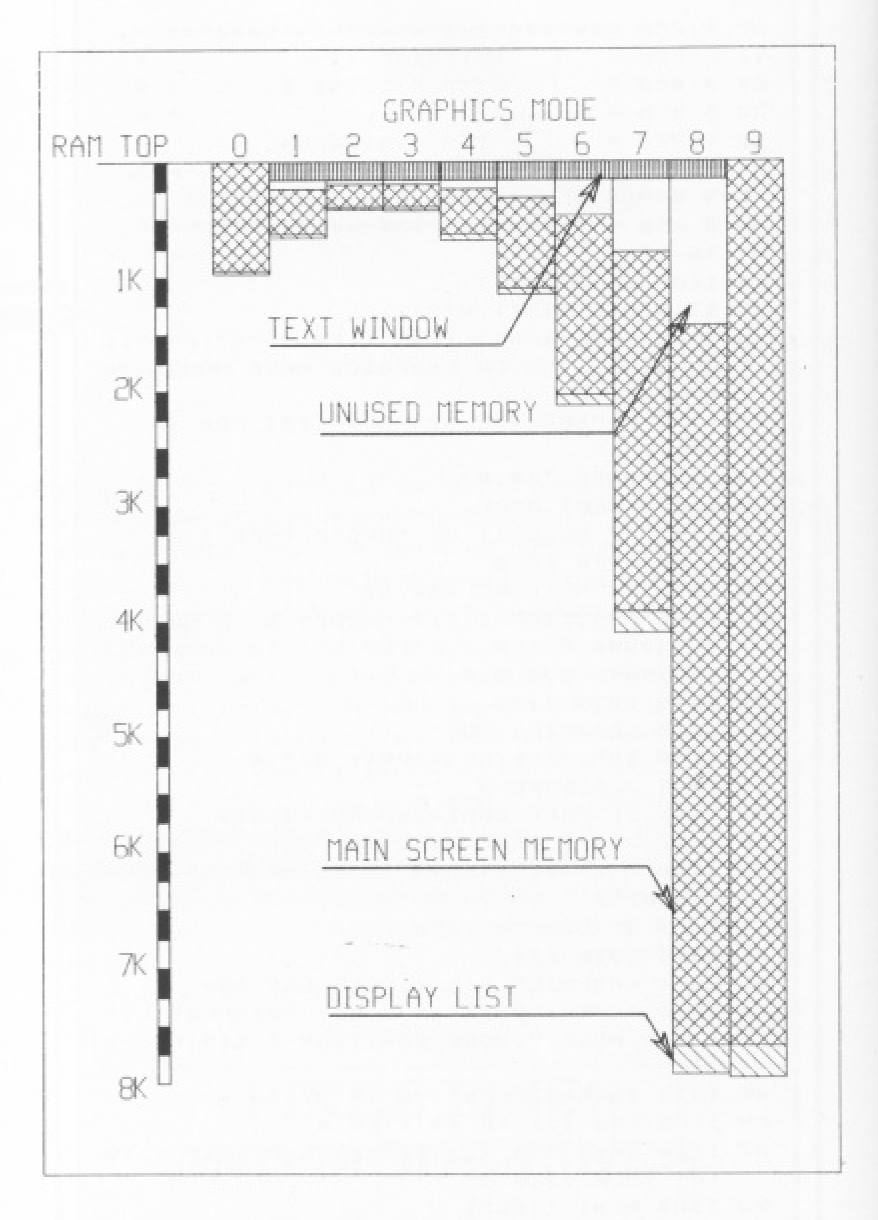
The next number, 66, is another LMS instruction. This is where the text window starts so the value is 64+2 for a GR.0 display. The address for data for the text window at the bottom of the ordinary GR.2 screen is in the next two numbers 96 and 159 - location 40800. A Basic "PRINT" command will put data in this window, while a "PRINT #6;" will put it into the main window.

Next we have three 2s which with the 2 in the LMS byte make the four line text window. Then 65 which means "this is the end of the display list, jump to the address in the next two bytes". The final two bytes (in this case 88,158) point to a new address - these bytes do not affect the display list and should not be changed if you are setting up a DL of your own or you computer is likely to hang up or crash.

continued

DL VALUE	REMARKS
112	3 sets of 8 blank scan lines at top of screen ensure none of the displayed image is lost at top edge
112	
112	
71	LMS instruction (64+7)
112	Address of start of screen memory 158x256+112 = 40560
158	
7x9	nine rows of GR.2 (OS mode 7)
66	LMS instruction for text window (64+2)
96	Address of start of text window data 159*256+96 = 40800
159	
2x3	three rows of GR.0 (OS mode 2)
65	Marks end of display list
88	Address that systems jumps to at end of DL (do not change these numbers when customising a DL)
158	

TABLE 2



THE SECOND LMS INSTRUCTION

As you can see a second LMS instruction can split the screen to give a mixture of graphic modes and can direct the computer to display data from different parts of memory. In a custom display list you can do the same, in fact you can split the screen into many separate areas though there is a practical limit to the diversity you can cram in on one screen.

There is, however, one occasion when a second LMS instruction is mandatory, even if you are not changing graphics mode, and that is when you are using a graphics mode that uses more than 4K of data. The system cannot track a continuous block greater that 4K so the display list has to redirect ANTIC when it gets to the 4K point to go and get more data starting at the next byte after the 4K limit. Program 1 generates display lists for some of the standard graphics modes (0 to 11) and if you run it for the higher graphics modes (8 and above) you will see examples where the extra LMS instruction is present. When working out your own DL you will have to take a bit of care to get this right when you are using the higher resolution modes.

AN EXAMPLE AND SOME TIPS

Program 2 gives an example of changing the DL. It is just a straightforward mixed mode screen as might be used in a title page, in fact I used it to illustrate an article on Title Screens back in 1988.

A FEW MORE TIPS

If you are generating your own DLs there are a couple more things to remember. Experiment freely, and if you get in a mess, unable to see what is going on because the screen has gone crazy try typing "GR.0 [RETURN]" and the graphics command should reset the display list.

Take care when using mixed text modes where some use 20 bytes per line and others 40. It is best to always use two lines of the 20 byte modes, otherwise you can get funny effects where the text is shifted half way across the screen.

If you have written a few lines of Basic to set up a new DL and want to see what you have achieved, run the program to set up the DL then LIST the program and the program lines will scroll up the screen through the different areas you have defined so you can quickly see where you have text and where you have graphics. You can do this with listing 2. RUN the program then press [BREAK] and type LIST [RETURN].

ADDRESSES

Here are a couple of addresses that are useful in finding your way around display lists:

Start of Display List (DLIST) PEEK(560)+PEEK(561)*256
Start of Screen Data PEEK(DLIST+4)+PEEK(DLIST+5)*256
Top of RAM PEEK(740)*256

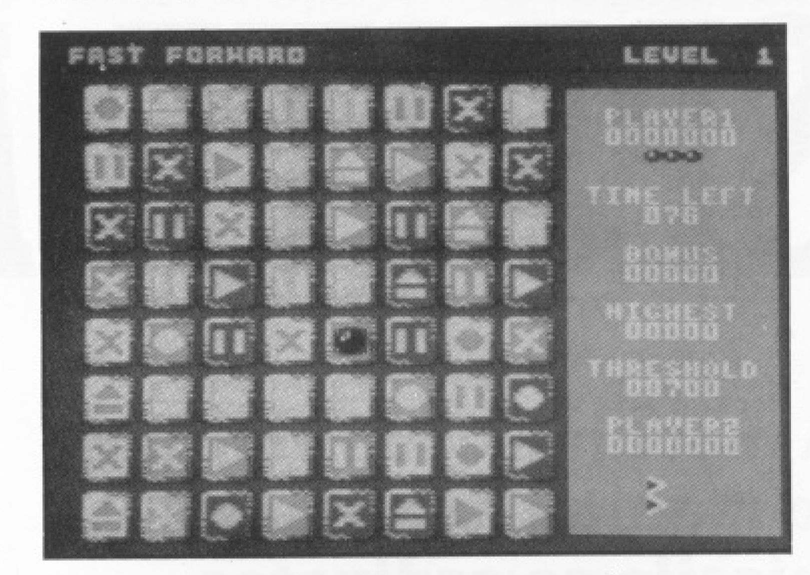
My address follows, please write if you have trouble with DLs or other Basic programming enclosing a stamped envelope for a reply.

Write to
IAN FINLAYSON
60 Roundstone Crescent,
East Preston, West Sussex, BN16 1DQ

DISK BONUS

SYMBOLISM

by Trevor Briscoe



A machine code thinker's challenge that will keep you on your toes

The BONUS on this Issue's disk is a 100% machine code game which should be booted with the OPTION key held. The title screen will appear from which the following may be selected

OPTION - alters the players/joysticks
SELECT - alters the difficulty
START - alters the starting screen level

Press the joystick in port 1 to start the game. When the introduction screen appears for any level, press the relevant joystick button.

PLAYING SYMBOLISM

You control a black marble bouncing around a grid of tiles. The joystick movements cause the marble to jump in the required direction and pressing the button makes the marble leap over the adjacent square.

Each tile in the grid has a colour and a symbol, the object of the game is to collect the tiles in sequence according to similar colours and/or symbols in order to gain bonus points. The points awarded for matching a tile to the previous tile at the base of the scoreboard are:

Same colour 25 points
Same symbol 50 points
Identical 100 points

As the marble gathers matching tiles, the bonus increases and when the highest bonus attained reaches a threshold level you can exit the screen by moving to the 'Gate Tile' and pressing the joystick button with the stick in the centre position. If you should bounce the marble over the edge of the grid, fall down a hole or bounce on a blank tile then your current bonus is reset to zero.

As the marble bounces along the tiles, it leaves a trail of blank squares, the tiles in this trail will flip over in turn to reveal new symbols which can be matched. If the trail catches up with the marble then it will be flung off-screen, however the Gate Tile is safe while the marble is bouncing on it. If the marble falls from the grid then it will not return until all of the blank tiles have flipped over.

When you complete a level, you will be awarded 'time credits' for every 10 seconds time remaining, these credits can be exchanged for rewards in the Time Bank. You can make a withdrawal of 4 credits from the Time Bank during any level and this will gain you an extra 20 seconds.

TIME BANK

If you complete a level and have 10 or more credits in the Time Bank then you will visit the bank and have a chance to exchange credits for services.

500 points	**10 credits**
Skip Next Level	**20 credits**
Play a Joker	**30 credits**
Time Chase	**40 credits**
Extra Life	**50 credits**

Skip Level - You will miss the next screen level but receive the points for completing it.
Play a Joker - The bonus you receive for your next screen will be doubled
Time Chase - Enter the bonus level
Extra Life - You will receive an extra life (maximum of 7 lives at any one time)

TIME CHASE

In the Time Chase bonus level you must follow the Gate Tile as it moves around the grid. The longer you manage to avoid falling through the grid, the more bonus points you will receive, but as time passes the tiles move faster and faster.

CONTROLS

Joystick movement ...	move marble
Movement + button ...	move marble two squares
ESC/OPTION	quit level
SPACE/SELECT	swap credits for seconds
START	return to title page

SPRITE MOVER

A machine code routine to manipulate player missile co-ordinates

by Robert Stuart

One of the Atari XL and XE's most useful (and least understood) features is the Player/Missile Graphics system, otherwise known as hardware sprites. These are special graphics which are totally independent from any graphic or text mode currently in use. By setting the priority register they can appear to move over and under other objects (sprites or normal character graphics) on the screen, without ever disturbing the background.

The sprites each have a separate colour, width (normal, double, or quadruple), and horizontal position register, but no vertical position register. Each sprite's vertical size is the entire height of the TV screen, so there are no vertical positions as such; the data for the sprite must be moved up or down inside the vertical strip. This can be done quickly in machine language, but is very, very slow in Basic. This is where this program comes in. It will set up an interrupt driven machine language routine which will run independently of your own Basic and machine code programs. The routine constantly updates the vertical and horizontal positions of the five hardware sprites using locations 1546-1555 as X and Y co-ordinates. The program runs in the vertical blank, so is executed 50 times per second, making the movement of the sprites nice and smooth.

The program works by storing two sets of co-ordinates. The first is the 'old' set, stored in locations 1536-1545, and these are used to erase the sprites at their previous positions, then the 'new' set is stored over the 'old' (to be used to erase the sprites next time they are moved), and finally the sprites are plotted using the 'new' set. This process is repeated every 1/50th of a second. The vertical co-ordinates range from 0-176 which keeps the sprites inside the screen border, and horizontally from 0-255 but remember positions 0-47 and 209-255 are off the side of the screen. The memory locations used for the co-ordinates are 1546 (vertical) and 1547 (horizontal) for sprite 1, 1548 and 1549 for sprite 2, 1550 and 1551 for sprite 3, 1552 and 1553 for sprite 4 and 1554 and 1555 for sprite 5. The fifth sprite is made up of the four missiles, but the routine requires only two co-ordinates, as the positions of the other missiles are worked out by the computer.

```
QJ 0 REM ******************************
BI 1 REM ** SPRITE X,Y CO-ORDINATES **
WX 2 REM *** BY ROBERT STUART 1991 ***
ZZ 3 REM **** FOR PAGE 6 MAGAZINE ****
QN 4 REM ******************************
DC 5 REM CLEAR SCREEN & SET PMBASE
XP 6 ? CHR$(125):POKE 54279,120:POKE 752,
   1:POKE 623,17:POKE 559,0
OU 7 REM SET COLOURS
LA 8 POKE 710,0:POKE 704,198:POKE 705,54:
   POKE 706,216:POKE 707,116:POKE 711,12
IT 11 REM DATA FOR SPRITE 1
AS 12 RESTORE 13:FOR F=32768 TO 32783:REA
   D X:POKE F,X:NEXT F
SO 13 DATA 0,60,126,255,153,153,255,255,2
   31,219,189,255,255,255,90,90
JX 14 REM DATA FOR SPRITE 2
JO 15 RESTORE 16:FOR F=32784 TO 32799:REA
   D X:POKE F,X:NEXT F
BT 16 DATA 0,0,0,0,0,0,0,0,0,8,28,62,127,
   62,28,8
LB 17 REM DATA FOR SPRITE 3
MU 18 RESTORE 19:FOR F=32800 TO 32815:REA
   D X:POKE F,X:NEXT F
BZ 19 DATA 0,0,0,0,0,0,0,0,0,8,28,62,127,
   62,28,8
LM 20 REM DATA FOR SPRITE 4
NG 21 RESTORE 22:FOR F=32816 TO 32831:REA
   D X:POKE F,X:NEXT F
BM 22 DATA 0,0,0,0,0,0,0,0,0,8,28,62,127,
   62,28,8
MQ 23 REM DATA FOR SPRITE 5
WC 24 RESTORE 25:FOR F=32832 TO 32847:REA
   D X:POKE F,X:NEXT F
DU 25 DATA 0,0,28,28,8,62,93,93,8,20,20,2
   0,20,54,0,0
RU 30 FOR F=31488 TO 32767:POKE F,0:NEXT
   F
AV 47 REM ******************************
ZE 48 REM VERTICAL BLANK INTERRUPT CODE
AZ 49 REM ******************************
VJ 50 RESTORE 60:FOR F=30720 TO 30946:REA
   D D:POKE F,D:NEXT F
RG 60 DATA 172,1,6,162,0,169,0,153,32,124
   ,232,200,224,16,208,247
TU 61 DATA 172,3,6,162,0,169,0,153,32,125
   ,232,200,224,16,208,247
WI 62 DATA 172,5,6,162,0,169,0,153,32,126
   ,232,200,224,16,208,247
YW 63 DATA 172,7,6,162,0,169,0,153,32,127
   ,232,200,224,16,208,247
UC 64 DATA 172,9,6,162,0,169,0,153,32,123
   ,232,200,224,16,208,247
IX 69 DATA 162,0,189,10,6,157,0,6,232,224
   ,10,208,245
MX 70 DATA 172,11,6,162,0,189,0,128,153,3
   2,124,232,200,224,16,208,244,173,10,6,
   141,0,208
KX 71 DATA 172,13,6,162,0,189,16,128,153,
   32,125,232,200,224,16,208,244,173,12,6
```

```
   ,141,1,208
UH 72 DATA 172,15,6,162,0,189,32,128,153,
   32,126,232,200,224,16,208,244,173,14,6
   ,141,2,208
NT 73 DATA 172,17,6,162,0,189,48,128,153,
   32,127,232,200,224,16,208,244,173,16,6
   ,141,3,208
HB 90 DATA 172,19,6,162,0,189,64,128,153,
   32,123,232,200,224,16,208,244,173,18,6
   ,141,7,208,24,105,2,141,6,208
JB 91 DATA 105,2,141,5,208,105,2,141,4,20
   8,76,98,228
WJ 197 REM **********************
BI 198 REM SET INTERRUPT VECTORS
WP 199 REM **********************
QZ 200 POKE 54286,0:POKE 548,0:POKE 549,1
   20:POKE 54286,64:POKE 53277,3:POKE 559
   ,62
NC 239 REM *******************************
CF 240 REM EXAMPLE PROGRAM USING SPRITES
MG 241 REM *******************************
EZ 245 FOR F=1536 TO 1545:POKE F,0:NEXT F
XA 250 ? CHR$(125):POKE 53278,1
LM 259 REM SPRITE CO-ORDINATES
YC 260 FOR F=1548 TO 1553:POKE F,RND(0)*1
   00+70:NEXT F:POKE 1554,80:POKE 1555,60
IT 269 REM JOYSTICK ROUTINE
NR 270 IF STICK(0)=11 AND PEEK(1554)>52 T
   HEN POKE 1554,PEEK(1554)-2
QO 275 IF STICK(0)=7 AND PEEK(1554)<196 T
   HEN POKE 1554,PEEK(1554)+2
MR 280 IF STICK(0)=14 AND PEEK(1555)>0 TH
   EN POKE 1555,PEEK(1555)-2
YV 285 IF STICK(0)=13 AND PEEK(1555)<176
   THEN POKE 1555,PEEK(1555)+2
LR 289 REM MONSTER MOVE ROUTINE
RE 290 IF PEEK(1546)>PEEK(1554) THEN POKE
    1546,PEEK(1546)-1
MD 295 IF PEEK(1546)<PEEK(1554) THEN POKE
    1546,PEEK(1546)+1
VW 300 IF PEEK(1547)>PEEK(1555) THEN POKE
    1547,PEEK(1547)-1
QV 305 IF PEEK(1547)<PEEK(1555) THEN POKE
    1547,PEEK(1547)+1
VB 319 REM COLLISION DETECTION ROUTINE
IM 320 IF PEEK(53260)=2 THEN FOR F=0 TO 2
   00 STEP 20:SOUND 0,F,10,10:NEXT F:POKE
    1548,0:POKE 1549,0:SOUND 0,0,0,0
PE 330 IF PEEK(53260)=4 THEN FOR F=0 TO 2
   00 STEP 20:SOUND 0,F,10,10:NEXT F:POKE
    1550,0:POKE 1551,0:SOUND 0,0,0,0
FS 340 IF PEEK(53260)=8 THEN FOR F=0 TO 2
   00 STEP 20:SOUND 0,F,10,10:NEXT F:POKE
    1552,0:POKE 1553,0:SOUND 0,0,0,0
PL 390 IF PEEK(1548)=0 AND PEEK(1549)=0 A
   ND PEEK(1550)=0 AND PEEK(1551)=0 AND P
   EEK(1552)=0 AND PEEK(1553)=0 THEN 250
NI 399 REM LOOP TO START OF PROGRAM
TZ 400 POKE 53278,1:GOTO 270
```

Here is a breakdown of the Basic program.

Line 6 clears the screen, sets PMBASE, gets rid of the cursor and turns off the screen to speed up the data poking.

Line 8 sets the sprite colours, and lines 11 to 25 contain the data for the sprite shapes.

Lines 47 to 200 poke in the machine code and set the interrupt vectors. The remainder of the program is an example of how the co-ordinates can be used. You control a little grey man who must guide a green alien around to pick up 3 diamonds. For some mystic reason the man can't touch the diamonds so he has to get the alien to pick them up!

Line 260 gives random positions to 4 of the sprites, (the alien and the 3 diamonds) and puts your man near the top left of the screen.

Lines 270 to 285 read the joystick and manipulate positions 1554 and 1555, which are the co-ordinates of your man.

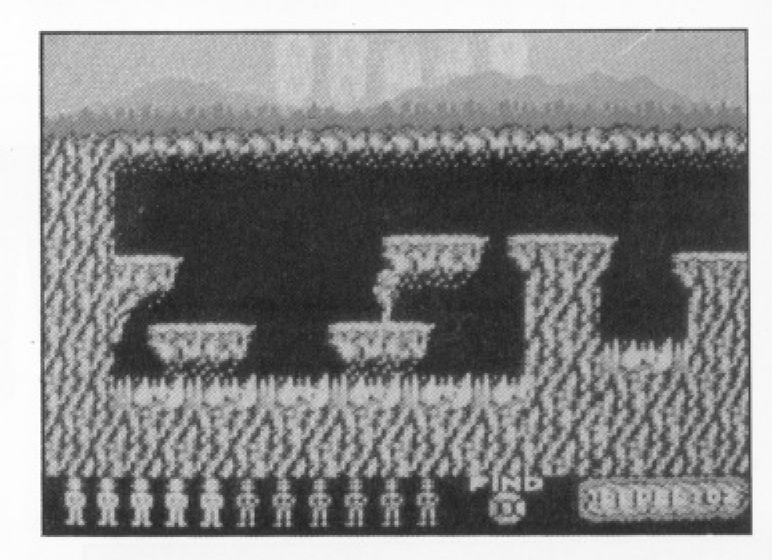
Lines 290 to 305 move the green alien around after your man, and lines 320 to 340 examine the sprite collision registers to see if the alien has touched the gems. When all the diamonds are collected, they are randomly re-plotted.

Line 400 clears the collision registers and loops back to the beginning of the example program.

Since the example is written in Basic, it is quite slow, but it is still much faster than moving data up and down inside the sprites' data strips. If you are handy with machine code, and can manipulate the X and Y co-ordinates using another interrupt routine, then your sprites will be zooming around the screen. Either way, you can now add a bit more life to those old programs!

Robert Stuart is a staunch supporter of the 8-bit Atari and hails from Bonnie Scotland. He is the man responsible for the EXCEL disk magazine mentioned in the last couple of issues

CAVERNIA



At long last Zeppelin Games has released a new title in it's superb range for the 8-bit Atari, titled Cavernia and programmed by the well known pair of Ivan Mackintosh and Richard Munns.

'You are Teddy Arklethorpe, ace pot-holer and leader of many dangerous expeditions into the bowels of the earth.' is the first sentence in the wonderfully illustrated inlay. It seems Teddy now wants to test his skills to the limits as well as getting his hands on the treasures of the Caves Of Cavernia.

You must control Teddy using a joystick in port one of your computer. The usual combinations of running and jumping are employed but all the moves are explained in the instructions. The aim is guide Teddy through all sixteen levels of Cavernia but on his way Teddy must collect a certain number of artifacts (which include rings, jugs and dogs!!) which will then be swapped for a key enabling him to enter the next level. In addition you must avoid various nasties and some fast falling stalactites. Collision with one of these will result in Teddy losing one of his spiritual eleven (yes that's right eleven) lives.

The screen is split up into three main parts, four fifths being the main play and status area which scrolls to the left as you move to the right and one fifth being green mountain scenery and blue sky. One really novel idea is your score displayed as large bouncing numbers in the sky portion of the screen.

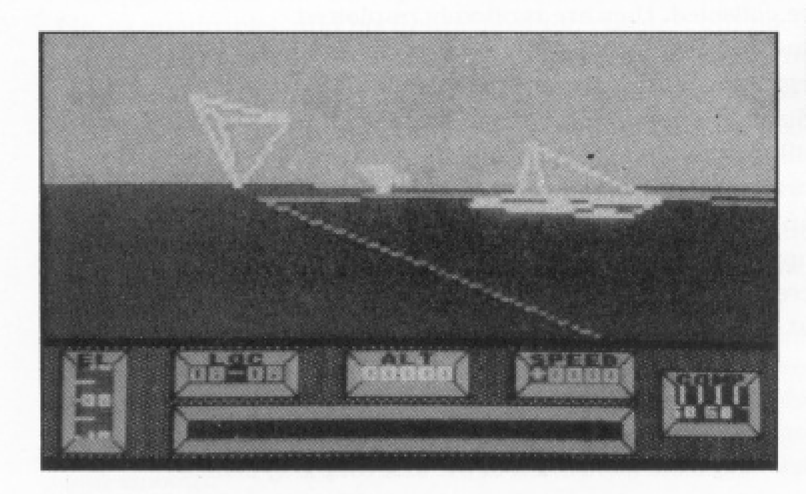
The graphics to the game are excellent, well on a par with Zybex and the animation of all the characters are truly superb, especially in the case of Teddy, whose climbing is very lifelike. Unfortunately, as with a lot of releases lately there is no music and sound effects are few and far between. The only real quibble I have is that after losing a life you must start again from the beginning of that level, but this is the case with most games of this nature.

The game is essentially a platform type game but it is really very good and I urge you to go out and buy it now. Unfortunately it will cost you three pounds ninety nine and not two pounds ninety nine, a new policy that many budget software companies are taking up on the lesser micros (Atari not included, of course).

Title:	**CAVERNIA**
Publisher:	**Zeppelin Games**
Price:	**£3.99**
Players:	**1**
Loading:	**12' 57**

Reviewed by Richard Gore

MERCENARY



The return of a classic! Novagen didn't produce much software for the 8-bit Ataris but when they did it was not to be ignored. Some time ago Atlantis Software re-released Novagen's excellent Encounter as a budget package - this time Novagen themselves have 'budgetised' author Paul Woakes' second and even more popular masterpiece - MERCENARY.

Mercenary is described as a combination of flight simulation, adventure and arcade style action. Your role is a 21st century soldier of fortune who has crash landed on the strife-torn planet of Targ. The action focuses on the planet's main areas of habitation which are now virtually deserted following decades of war between the normally peaceful Palyars and the invading Mechanoids. Adopting a mercenary role you proceed to explore the planet, hoping to find the ways and means of escape. There are several approaches to the task which could all prove to be equally successful. You can swear allegiance to either side or play them both off against each other in a bid to lay your hands on an intergalactic craft that will carry you away from Targ. Your only reliable assistant is Benson, your in-helmet ninth generation PC, who displays your guidance systems and provides an interpretation for your view of events in brilliant three-dimensional vector graphics.

The action unfolds in real-time as you set about exploring the cities of Targ and their mysterious subterranean complexes, all the while becoming more deeply embroiled in the conflict between the Palyars and their robotised foes. Should you get tired of roaming around on foot, you can hop aboard one of several high-speed aircraft. There are lots of objects scattered around which can be picked up and dropped as required. Some are useful, some are not - old games magazines are chock-full of hints and tips to help you along the way. The save game feature is an essential part of this game!

There's considerably more to Mercenary than I could possibly mention here. It's really up to you, the adventurer, to explore and discover - though Novagen do supply some very useful notes enabling you to get easily started. The 3-D vector graphics are excellent, the package does not suffer from its 'budget' transformation, and the whole game is guaranteed to keep you enthralled for many sessions to come. Quite simply, Mercenary is an undisputed classic - don't miss out on this one.

Title:	**MERCENARY**
Publisher:	**Novagen**
Price:	**£2.99 cassette**
Players:	**1**
Loading:	**15'30"**

Reviewed by Paul Rixon

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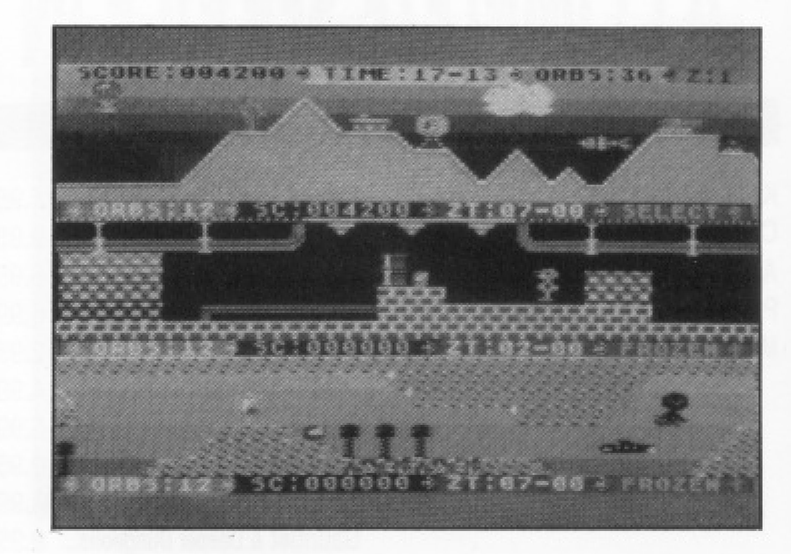
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TIMESLIP



Who remembers English Software? Once upon time they churned out dozens of games for the Atari, including hits such as Jet Boot Jack, Elektraglide, Chop Suey and Mediator - all of which can be highly recommended. The author of Jet Boot Jack - Jon Williams - also produced a game called TIMESLIP which, for some reason, hardly got a mention in the computing publications. As Byte Back have now decided to re-release the title (see 'Budget Delights' last issue), I think we should make amends by taking a closer look.

Title:	**TIMESLIP**
Publisher:	**Byte Back**
Price:	**£2.99 cassette**
Players:	**1**
Loading:	**8'30"**

Reviewed by Paul Rixon

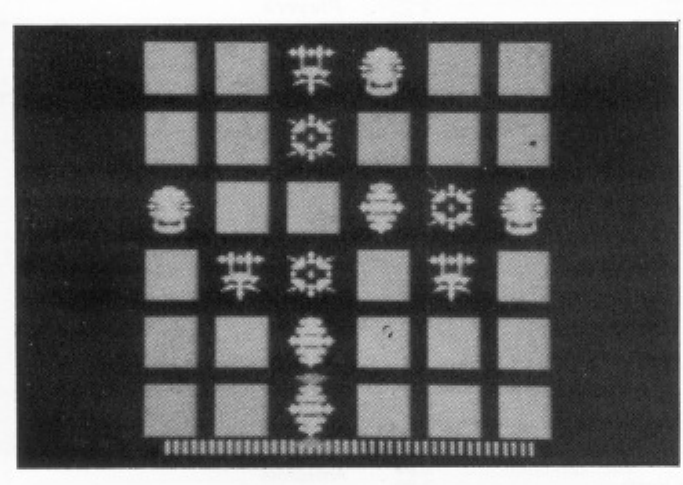
The story concerns a distant planet that's in a state of 'Timeslip'. Whatever this means, the important point is that it's likely to result in disaster so it's crucial that the disturbance is dealt with. The only way to achieve stability is to travel deep into the planet's three time zones, annihilate a collection of time orbs and then synchronise the respective timers to zero. You've been allocated twenty-four hours to complete the task.

Playing the game is a lot easier than trying to explain it! The screen is divided vertically into three scrolling scenarios, each representing a time zone. The game is basically a triplicate version of 'Scramble' - the idea is to manoeuvre a craft through the constantly scrolling backdrops, avoid the obstacles and blast everything in sight. Your principal objective is to knock out the time orbs but you must also be careful not to collide with the hazardous surroundings. As you progress, the timer for the current zone counts steadily downwards - to complete the zone, it must reach zero. The best policy is to keep your finger pressed tightly on the trigger and concentrate on negotiating the nasties. If you collide too many times, a 'Timeslip' occurs and scrambles the timers, making it more difficult to complete the mission.

The graphics are really superb. The zones differ widely in style - on the first you're the pilot of a starfighter craft flying above the planet's surface, on the second you're Jet Boot Jack skimming through underground caverns, and on the third you're the commander of an attack submarine.

In my opinion, Timeslip is one of the most underrated games in Atari history. If you enjoy shoot 'em ups of the Scramble variety, this one must be right up your street. You don't just get one game for your money, but three! Byte Back are onto a winner here.

AMNESIA



Here's a new game from the group of Scottish Atari enthusiasts who recently launched a disk magazine called 'Excel'. The first edition received a very favourable review in these pages. AMNESIA was included with the first issue (at least two others have since been published) and, following their success, the authors have now decided to offer the game to a wider audience by releasing it on cassette.

I must admit that before I'd experienced this game I was expecting to find an amateurish style production - but this preconception soon evaporated once the loading had completed. Although the game itself is intrinsically very simple, and by no means unique, the programming has been competently done and the graphics show a touch of class.

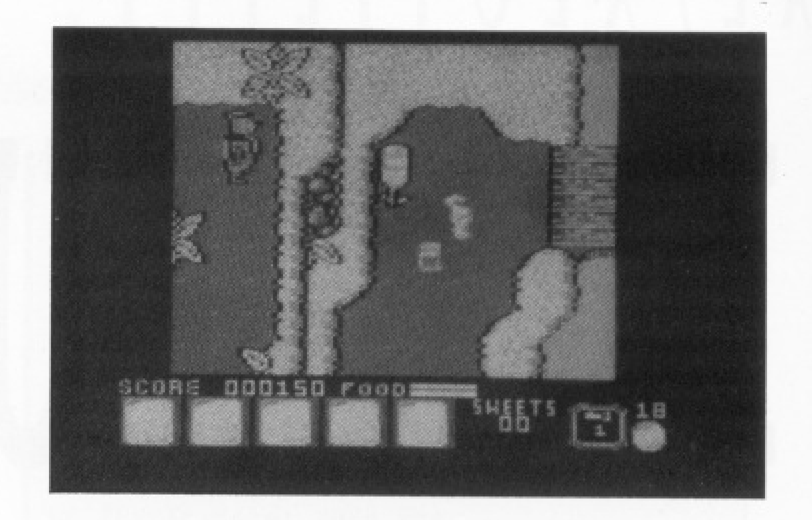
The player is faced with a grid of tiles, each tile concealing an animated icon. The aim of the game is to remove the tiles in groups of three so as to uncover matching sets of icons. If all three icons are identical they remain uncovered, but if they're not, you're only entitled to a very brief glimpse. It's quite a challenge since on each level the cleverly shaded designs, which appear to represent various components of machinery, share a single colour. It's not easy trying to remember the respective locations - but then, of course, that's the intention! To complicate matters further there's a time limit to keep you on your toes and, unfortunately, an otherwise commendable tune that plays continuously throughout and soon becomes rather an irritant. It might have been a good idea to include some alternative difficulty settings, as younger players may soon give up in frustration. A high-score table (recording the least number of tries needed to complete the puzzle) would be a nice addition, too.

If you revel in games that challenge the mind, Amnesia will not disappoint you. After several hours play, you'll never need a Post-It note again! The program has been put together in a professional way and although it's very straightforward and not exactly the most original idea around, it must score quite highly in terms of lasting appeal. I haven't seen the Excel disk magazine yet, but if the quality of Amnesia is any pointer to that of the mag, disk drive owners would appear to be in for a treat. Why not show some appreciation to the guys from Strathclyde for their desperately needed support?

Title:	**AMNESIA**
Publisher:	**Excel**
Price:	**£3.95 cassette**
Players:	**1**
Loading:	**14'10"**

Reviewed by Paul Rixon

YOGI BEAR & FRIENDS IN THE GREED MONSTER



With their latest publication in the series featuring popular Hanna-Barbera cartoon characters, Hi Tec have devised what is probably one of the longest game titles in existence! Yogi Bear & Friends in the Greed Monster: A Treasure Hunt (let's call it THE GREED MONSTER for short!) is another production from PAL Developments, whose name seems to crop up with almost every new release nowadays.

We're told that Yogi and his pals have received a disturbing report from Top Cat that all the world's toys have been stolen, and they've set out on a quest to discover the explanation. Whilst out exploring, Yogi's friends somehow fall into the hands of a mysterious Greed Monster, leaving Yogi all alone with more than a bit of a problem! Not only must he recover the toys, he's now got to rescue the other five members of the group.

You must help Yogi through the perilous landscapes, collecting various objects that will help to overcome the dangers and lead to his captive friends. The screen view consists of a large 'window' which flips as Yogi walks across the boundaries into new locations. Unfortunately, the colouring is characteristically yukky-brownish (see gripes last issue!) and some of the inevitable nasties aren't too cleverly defined, however these drawbacks aren't too serious - my main objection is that the screen shots on the inlay indicate the Atari graphics are inferior to the Crummydore 64 version!

As with most arcade adventures, the best strategy is to map the layout - once you've done this, it should prove to be reasonably straightforward. It's not all plain sailing, though. Firstly, there are a number of locked doors to contend with - you're required to find the corresponding keys - and secondly, the locations are bustling with adversaries that can drastically reduce Yogi's food supplies. There are a number of useful objects to look out for, including jars of sweets that can be used as ammunition to fire at the nasties, cans of pop that double Yogi's speed and jars of honey that make him impervious to danger for a limited time. When Yogi stumbles across one of his mates, a portrait in the status line is revealed.

If you enjoyed Yogi's Great Escape there's no doubt you'll find The Greed Monster equally worthwhile. Arcade adventures can be lots of fun and are generally very addictive - this one's no exception.

Title:	**THE GREED MONSTER**
Publisher:	**Hi Tec**
Price:	**£2.99 cassette**
Players:	**1**
Loading:	**11'45"**

Reviewed by Paul Rixon

FRUIT MACHINE SIMULATOR

Codemasters are well known for publishing games with the world 'simulator' in the title - in truth, they seldom seem to produce anything else! This time they've devised what they claim is the 'first real fruit machine simulator'. As everyone knows, simulating fruit machines is anything but a unique concept - such games abound in the Atari world, both commercially and in type-in format - but Codemasters add credibility to their bold statement by listing a myriad of features that would appear to leave the competition without a reel to spin on!

The good news is that the screen shots from other computers shown on the packaging do NOT leave the Atari version standing. In fact, I'd dare to suggest that we have been treated to a superior product! I suspect the reason is that the game was developed independently by a guy from Callisto Computers, rather than being translated directly from the other formats. The game is confined to a single screen but it's been designed with an eye for detail and due consideration for 'user friendliness'. The author has done a terrific job with the colours - there are so many that it looks like the aftermath of an explosion in a paint factory - which goes to show that there's more to Atari programming than a few shades of yukky brown (other programmers PLEASE take note!). The controls are fully joystick operated so all you have to do is point and click a 'hand' that pops up at the appropriate time.

There's no need for me to explain the objective of this game, suffice to say that you start with a couple of pounds and inevitably end up broke! As usual there are 'nudge' and 'hold' features plus the option to gamble or collect your winnings. On the right of the screen there's a spiral maze and, in the centre, a character called 'Dizzy'. If you collect a fruit bearing a digit, Dizzy jumps a corresponding number of places around the maze - if he lands on a letter you can gain goodies such as extra nudges, a free spin or some money for the credit bank.

Far from being 'just another fruit machine simulator', this one is probably the best you can buy. If you like gambling, you'll find this game is incredibly addictive and great fun - and it could save you an awful lot of money!

Title:	**FRUIT MACHINE SIMULATOR**
Publisher:	**Codemasters**
Price:	**£2.99 cassette**
Players:	**1**
Loading:	**9'30"**

Reviewed by Paul Rixon

DOS CUSTOMISER

Yuval Rabinovich presents a handy utility that means you can have your own version of DOS 2.5

DOS 2.5 from Atari is well documented and user-friendly. Its documentation is detailed enough to let you configure your system. With a few POKEs you can set verify on or off, decide on the maximum number of open files at a given time, and so on. Compared to us, IBM users, for example, have to reboot their systems every time they want to change system configuration.

Whenever I look for the right POKE however, I have to go through old books and magazines to find what I am looking for. That is why I have written CSTMDOS. It is a menu driven utility that enables you to modify DOS to your needs, and if you like, you can save your modified DOS.SYS file to disk.

Type in the accompanying listing, CSTMDOS.BAS, check it with TYPO 3 and SAVE a copy before you RUN it. The program displays a menu on the screen, and a 'greater than' cursor (>). You can move the cursor with the up-arrow and down-arrow keys. Holding the CONTROL key is not necessary. To change an option that the cursor points to, press the RETURN key. A 'prompt window' at the bottom of the screen will let you specify the required change. You can leave the prompt window at any time by pressing the ESC key.

MENU OPTIONS

Here are the menu options, one by one:

Maximum # of open files

As you probably know, you can open a few files simultaneously. DOS 2.5 defaults to a maximum of 3 open files, but you can change this number. Remember that increasing this value decreases the available memory of your Atari by 128 bytes per file, so do not use more than you need. If you really need more memory for an application, you may try to decrease this value, keeping in mind that the application itself may require a higher number, and you may need to experiment. Available values range from 1 to 7 (there are 8 IOCBs, but IOCB #0 is always used for the screen display).

Active drive #s

As it comes from Atari, DOS 2.5 recognizes drive numbers 1,2, and 8. This is because many users have two disk drives, and on a 130XE computer there is a RAMdisk available, which is treated as drive #8 by the system. If you want to attach more than two drives, you will have to tell the computer about it. This option will show you a table of drives 1-8, allowing you to toggle any of them. After setting the needed changes, press RETURN to accept the change, or ESC to abort. Each additional drive eats up 128 bytes, so again, do not use more than you need.

Verify

Atari disk writes are slow, but safe. This is because whenever the computer writes anything to the diskette, it immediately reads it to make sure it was properly written. You can turn the verify off, effectively increasing the speed of disk SAVEs. Although it is theoretically less safe, I never had any problems with diskettes written without verify. Experiment with your system to find out whether you need the verify on or not.

of writing retries

When the verify is on, any disk write error will be captured, and the computer will try to write again to the diskette a few times before it reports an error. The default is retry three times, but you can change it from zero to 255. Personally, I would not recommend to make it more than 3, because if the disk is in such a condition that three retries are unsuccessful, it is best to copy all the diskette files to another diskette, and throw the damaged diskette away.

Drive for DUP.SYS

DOS 2.5 has a file called DUP.SYS that loads whenever you type the DOS command from BASIC or boot the computer without BASIC. This file has the familiar DOS menu. On computers that have less than 128K memory, this file is loaded from drive #1. On an Atari 130XE, that has 128K, a virtual 'RAMdisk' is formed from 64K, and the DUP.SYS file is copied to it. Later, whenever you access the DOS menu, it is instantly loaded from that part of memory, which is treated as drive #8. To conclude: DUP is loaded from drive #1 on most machines, and from drive #8 on machines that have 128K or more. Although it is usually very convenient, one might want more room on the RAMdisk, and to access the DUP from another

```
EX 1 REM ####################################
LL 2 REM #      DOS 2.5 CUSTOMIZER        #
GE 3 REM #            by                  #
EY 4 REM #      Yuval Rabinovich          #
HC 5 REM # ---------------------------- #
NJ 6 REM #  NEW ATARI USER - AUG 1991 #
FD 7 REM ####################################
NN 8 REM
GP 10 GRAPHICS 0:POKE 82,1:POKE 83,39:POKE 752,1:? :? " DOS 2.5 Customizer - By Y.Rabinovich "
MB 15 IF PEEK(1913)<>80 AND PEEK(1913)<>87 THEN POKE 82,2:POKE 752,0:? :? "This is not DOS 2.5":END
TJ 20 DIM FN$(10),RET$(3),BIN$(16):FN$="D1:DOS.SYS":RET$="000"
CV 50 ? :? "> 1. Maximum # of open files (1-8): ";PEEK(1801):POKE 82,3
DW 60 ? :? "2. Active drive #s:";:GOSUB 2000:? BIN$
TL 70 ? "                              12345678 "
BV 80 ? "3. Verify: O";:IF PEEK(1913)=87 THEN ? "n  ":GOTO 90
ES 81 ? "ff "
AU 90 ? :? "4. # of writing retries: ";PEEK(1948)
SB 100 ? :? "5. Drive for DUP.SYS (1-8): ";CHR$(PEEK(5439))
IM 105 POKE 85,1:? "______________________________________"
KR 110 ? "6. Write new DOS.SYS"
SQ 120 ? :? "7. Format a new disk"
VV 125 ? :? "8. Exit to BASIC"
IW 127 POKE 85,1:? "______________________________________"
KZ 130 ? :? :GOSUB 1000
MU 200 POSITION 2,3:OPEN #1,4,0,"K:":POKE 82,1
AA 210 GET #1,K:IF K<>45 AND K<>61 AND K<>155 THEN 210
JR 220 IF K<>45 THEN 250
BE 230 A=PEEK(84)-2:IF A=1 THEN A=17
HQ 240 ? "◂":POSITION 1,A:? ">";:GOTO 210
LF 250 IF K<>61 THEN 280
GL 260 A=PEEK(84)+2:IF A=19 THEN A=3
HW 270 ? "◂":POSITION 1,A:? ">";:GOTO 210
AT 280 ROW=PEEK(84):LOCATE 3,ROW,K:K=K-48:? "←";K:POSITION 2,21:? "↑";
IB 285 IF K=8 THEN POKE 82,2:POKE 752,0:GRAPHICS 0:END
AL 290 ON K GOSUB 300,400,500,600,700,800,900:GOSUB 1000:POSITION 2,ROW:? "→←";:GOTO 210
RM 300 ? "How many open files do you need               at the same time (1-8) >█←";
LG 310 GET #1,K:IF K=27 THEN RETURN
BR 320 K=K-48:IF K<1 OR K>8 THEN 310
IM 330 POSITION 37,3:? K;:POKE 1801,K:RETURN
SQ 400 ? "↑↑";BIN$;"      RETURN to accept    12345678      ESC to abort      Enter drive # to toggle (1-8) >█←";
JK 405 BIN=PEEK(1802)
DD 410 GET #1,K:IF K=27 THEN BIN=PEEK(1802):GOSUB 2000:? "↑":RETURN
FL 420 IF K=155 THEN ? "↑":POKE 1802,BIN:POSITION 22,5:? BIN$:RETURN
CZ 430 K=K-48:IF K<1 OR K>8 THEN 410
VE 440 POSITION 33,21:? CHR$(K+176):LOCATE K*2,19,T:IF T=43 THEN ? "←-";:BIN=BIN-2^(K-1):BIN$(K*2,K*2)="-":GOTO 410
```

continued

less used drive, such as #2. Therefore, the option is given here to set any other drive that the computer will access whenever the DUP menu is required.

Write new DOS.SYS

After setting all the above parameters, you can write a modified DOS.SYS file to a diskette. When you boot with this diskette, your preferred options will be automatically set. If you do not save this file, you will have to set the parameters again whenever you turn the computer on. You will be asked for a drive number. The computer will check if a DOS.SYS file already exists. If it does, you will be asked whether you want to overwrite it.

Format a new disk

It would be a pity if, after all the careful parameter setting, you realize that you have forgotten to format a new diskette. Therefore, the option is given here to format a diskette. After you use this option, you can write to your freshly formatted diskette the new DOS.SYS, using the appropriate option.

Exit to BASIC

After you have finished with the program, you may exit to BASIC. Your preferred setting will remain active in memory until you turn the computer off or change it again with this program.

DOS CUSTOMISER

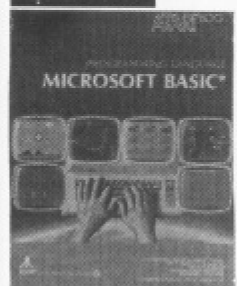
```
IY 450 ? "←+";:BIN=BIN+2^(K-1):BIN$(K*2,K
   *2)="+":GOTO 410
ZJ 500 ? " RETURN toggles verify  ESC can
   cels";
TN 510 GET #1,K:IF K<>27 AND K<>155 THEN
   510
WZ 520 IF K=27 THEN RETURN
GD 530 K=(PEEK(1913)=80)*7+80:POKE 1913,K
   :POSITION 15,7
OS 540 IF PEEK(1913)=87 THEN ? "■n  ":RETU
   RN
LU 550 ? "■ff ":RETURN
TC 600 IF PEEK(1913)=80 THEN ? "Not avail
   able with verify Off          Press an
   y key to continue";:GET #1,K:RETURN
YE 610 T=PEEK(1948):K=1+(T>9)+(T>99):RET$
   (4-K)=STR$(T)
QG 620 ? "How many times to retry (0-255)
   >";
SW 630 POKE 85,35:? RET$;
LP 640 GET #1,K:IF K=27 THEN RETURN
LB 650 IF K=155 THEN 680
JQ 660 K=K-48:IF K<0 OR K>9 THEN 640
DH 670 RET$=RET$(2):RET$(3)=STR$(K):T=VAL
   (RET$):GOTO 630
DL 680 IF T>255 THEN ? :? "■Number too bi
   g. Hit any key";:GET #1,K:? "■↑";:GOTO
    640
DO 690 POKE 1948,T:POSITION 20,9:? T;"  "
   :RETURN
TE 700 ? "Enter drive # for DUP.SYS >■←";
LK 710 GET #1,K:IF K=27 THEN RETURN
GP 720 K=K-48:IF K<1 OR K>8 THEN 710
VX 730 IF BIN$(K*2,K*2)="+" THEN POKE 543
   9,K+48:POSITION 31,11:? K:RETURN
QX 740 ? CHR$(K+176):? "■D";K;": is not a
   n active drive.          Hit any key
    to continue.";
EN 750 GET #1,K:? "■↑";:POSITION 28,21:GO
   TO 710
BC 800 ? "Write DOS.SYS to what drive >■←
   ";
LY 805 GET #1,K:IF K=27 THEN RETURN
MW 810 K=K-48:IF K<1 OR K>8 THEN 805
XL 815 ? CHR$(K+176);:IF BIN$(K*2,K*2)="+
   " THEN 830
XE 820 ? :? "■D";K;": is not an active dr
   ive.           Hit any key to continu
   e.";
ER 825 GET #1,K:? "■↑";:POSITION 30,21:GO
   TO 805
WS 830 TRAP 880:FN$(2,2)=STR$(K):CLOSE #1
   :OPEN #1,4,0,FN$:CLOSE #1:OPEN #1,4,0,
   "K:"
TZ 835 ? "■";FN$;" exists.
        Overwrite it? (Y/N)>■←";
RW 840 POKE 694,0:POKE 702,64:GET #1,K:IF
    K<>27 AND K<>78 AND K<>89 THEN 840
DL 845 IF K=27 THEN TRAP 40000:RETURN
QR 850 IF K=78 THEN ? "■";:GOTO 800
YN 855 ? "■";:CLOSE #1:XIO 36,#1,0,0,FN$
MA 860 CLOSE #1:? "■Writing ";FN$;:OPEN #
   1,8,0,FN$:CLOSE #1:OPEN #1,4,0,"K:":TR
   AP 40000:RETURN
GQ 880 CLOSE #1:OPEN #1,4,0,"K:":TRAP 880
   :T=PEEK(195):IF T=170 THEN 860
VY 885 ? "■Unexpected error #";T;".
             Hit any key to continue.";
CO 890 GET #1,K:? "■";:GOTO 800
KT 900 ? "Enter drive # to format >■←";
LM 910 GET #1,K:IF K=27 THEN RETURN
JB 920 K=K-48:IF K<1 OR K>8 THEN 910
NM 930 IF BIN$(K*2,K*2)="+" THEN 960
QZ 940 ? CHR$(K+176):? "■D";K;": is not a
   n active drive.          Hit any key
    to continue.";
FJ 950 GET #1,K:? "■↑";:POSITION 26,21:GO
   TO 910
BK 960 ? "■Hit RETURN to format D";K;": |
   ESC aborts.";
JJ 970 GET #1,K:IF K<>27 AND K<>155 THEN
   970
XP 980 IF K=27 THEN RETURN
UR 990 TRAP 998:FN$(2,2)=STR$(K):CLOSE #1
   :? "■Formatting.... ";FN$(1,3);:XIO 25
   4,#1,0,0,FN$(1,3):OPEN #1,4,0,"K:":RET
   URN
PX 998 CLOSE #1:OPEN #1,4,0,"K:":? "■Unex
   pected error #";PEEK(195);".
            Hit any key to continue.";
EQ 999 GET #1,K:? "■";:GOTO 900
MZ 1000 POSITION 3,21:? "■ ■■■■ Move
     RETURN Select";:RETURN
TH 2000 BIN$=" - - - - - - - -":BIN=PEEK(
    1802):I=128:T=8
CO 2010 IF BIN>=I THEN BIN$(T*2,T*2)="+":
    BIN=BIN-I
AD 2020 I=I/2:T=T-1:IF T>0 THEN 2010
AJ 2030 RETURN
```

THE ACCESSORY SHOP
ISSUE 51

SERIOUS SOFTWARE

This issue we continue the more serious software and also have some games software at very special prices detailed on the inside front cover and in the following pages. Some items previously advertised are now sold out but there are still a selection of word processors for you to choose, from the most simple to the most complex - the choice is yours. Also there is one comms packages left and lots of educational titles. As always we are able to offer these items at considerably less than the recommended price so check through these pages.

NEW!



DISK ONLY

MICROSOFT BASIC

Microsoft Basic II is now sold out but you can still practice programming in the standard Basic if you have a disk drive. Microsoft Basic is ideal is you want to convert programs from other machines as it contains many of the commands that are missing from Atari Basic. You'll be able to share the creation of programs with other computer owning friends and maybe type in and adapt listings written on other computers.

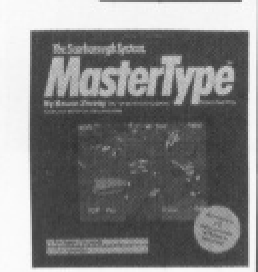
Recommended price £9.95

OUR PRICE £5.95

MASTERTYPE

NEW!

Now anyone can learn to type whilst playing a challenging game. Mastertype was one of the original 'game based' typing tutors which requires you to zap enemy words as they approach from the four corners of the screen. But it not really a game for, before you realise it, you will become quite proficient on the keyboard as you progress through 18 lessons of increasing complexity.



Recommended price £14.95

OUR PRICE £2.95

ROM CARTRIDGE



PRINT SHOP GRAPHICS

The official PRINT SHOP Graphics Library comprises three separate disks each with 120 graphics and a printed out reference guide of the new icons. Disk 1 covers Holidays, Special Occasions, Sports and more, Disk 3 covers Business, Symbols, Mythology and others. ONLY No.s 1 and 3 NOW AVAILABLE.These are all top quality graphics in the original Broderbund Print Shop packaging.

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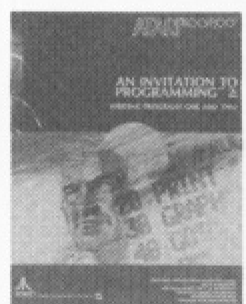
BASIC COMPILER

Compile your Basic programs into 6502 machine code! Unlike other compilers which require a separate run-time program the Datasoft Basic Compiler creates stand alone programs in machine code with the added benefit of also creating assembler files that can be used with other Assembler programs. Could be an ideal way to learn Assembler, just write a routine in Basic, compile it and study the same routine in Assembler!

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CASSETTES

INVITATION TO PROGRAMMING
THREE PACKAGE OFFER!

Cassette users wishing to learn Basic programming have never had it so easy! Alongside the fine programming books we have available, we are now able to offer the full three part Invitation To Programming series comprising FIVE cassettes and two workbooks. The series covers Fundamentals, Writing Your Own Programs and an Introduction to Sound and Graphics. With these actual, on-screen, examples your programming books will come alive and you will be writing your own programs in no time. Start to program now at our bargain price!

Original Price £32.97

OUR PRICE £5.00

LETTER WIZARD

For those who need a little more sophistication in a word processor, Letter Wizard gives you all of the basic features you would expect plus mail merge, print of selected pages, headers and footers, automatic page numbering and a whole host more print formatting styles. Although set up for Epson compatible printers or the NEC 8023, control codes can be sent direct to the printer. Comes with an easy to learn and use manual plus a handy Quick Reference card.



Original Price £19.95

OUR PRICE £8.95

DISK ONLY



ROM CARTRIDGE

TELELINK

The simplest to use comms package ever available, just plug it in and go! Telelink is a basic, no frills, communications program that will have you up and running in no time. Ideal for simple access of your local Bulletin Board or for access to the major International Information Services. Optional dump of buffer to a printer. The most basic of facilities but the simplest and quickest to use comms program available.

Original Price £14.95

OUR PRICE £4.00

TEXT WIZARD

If you don't need a very powerful word processor but still want to use your Atari to help with producing written documents Text Wizard could be the answer. A simple to use and easy to learn word processor that has the basic features such as search and replace, move and duplicate text and straightforward print formatting including double column print out. The print commands are set for Epson compatible printers. Text Wizard will get you printing without getting you confused.



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STATISTICS

A general statistical program in which you enter your data to discover various statistics including, mean, mode, median, standard deviation, variants, skewness, kurtois and root mean square. Data can be altered and saved. Ideal for schoolwork or study.

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NEW!

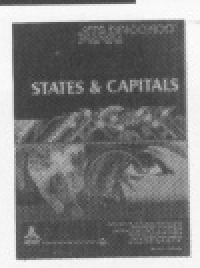


A nuclear power plant simulation in which you must learn to operate the plant under normal and emergency conditions. The program trains you in the operation of the plant and then tests you with a qualifying exam in the form of a game. Once you are in charge you will find earthquakes breaking components and you will have to find the best way to repair the installation and keep it going to avoid meltdown

OUR PRICE JUST 99p!

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NEW!



STATES AND CAPITALS

Learn the geography of the United States with this program which draws outline maps of each of the States and asks you to identify it and its capital. Useful for school geography and for anyone interested in the USA.

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KINGDOM

NEW!



Do you have what it takes to rule a country? This simulation puts you in charge of a small agricultural kingdom in which you must determine the farming strategy for the long term benefit of the community. Catastrophes befall the people and the crops, and you must determine how best to regulate the buying, selling and planting of crops. If successful you will be re-elected but how long can you survive?

OUR PRICE JUST 99p!

CASSETTE ONLY

BARGAIN BOOKS

Books for the Atari 8-bit computers are now becoming very difficult to obtain with almost all the Compute! titles now out of print so we are very pleased to have been able to secure a supply of some of the early British books covering the XL/XE range. Don't be put off by the low prices, we are only passing along the enormous savings we have been able to obtain. All these books are brand new and most are shrink wrapped so you will find them of top quality. If you are interested in programming with your Atari almost all of these books will help in some way and at these prices you can afford to experiment!

Please note that because of the high cost of posting books orders will only be accepted if the £1.00 postage charge shown on our order form is included

EASY PROGRAMMING FOR YOUR ATARI MICRO



This book went out of print 3 years ago and we have been searching for a replacement ever since. We are absolutely delighted to have found more stocks of one of the best beginner's books ever published. Over the past couple of years whenever someone has phoned for a beginners book on programming we have advised then to try and find a second hand copy of this book - now you can buy it once again, brand new! By the end of this book you'll be writing your own programs, including those with full graphics and sound.

OUR PRICE £5.95

THE 130XE HANDBOOK

A programming book which covers not only the machine mentioned in its title but also the 65XE, 800XL and earlier models. The book will take you from the first steps in programming up to writing good, structured programs. One chapter is devoted to the sound capabilities of the XL/XE with details of the sound chip itself allowing you to create more sounds than is normally possible with Basic. Four chapters cover graphics including Display List programming, Player Missile Graphics and redefining characters. There are extensive appendices covering Basic commands, Error codes, sound and graphics references and much more. An ideal companion for novice and intermediate programmers.

Published price £7.95
OUR PRICE £3.00

ATARI ADVENTURES

An excellent book written by adventure expert Tony Bridges covering adventures in general and showing how you can write your own adventures on the Atari. This book has in fact formed the basis for some of the adventure listings that have been published in PAGE 6. Tony will take you through examples of commercial adventures with lots of background to all different types of adventure and then show you how all these ideas can be put together in your very own adventure. There is a playable adventure listing called The Eye of The Star Warrior to show you just how it all comes together. Everything you need to know to write your first adventure.



Published price £5.95
OUR PRICE £1.50

MICRO ENQUIRER

A large format book that covers the world of micros in general with some specific Atari sections. The book contains a lot of worthwhile background information on home computing and is ideal for those who are recent converts or who want to expand their general knowledge of computers. It covers all sorts of topics including languages, bulletin boards, CAD, Data Processing, Printers, Artificial Intelligence and much more. There are a few Atari specific programs to illustrate various concepts but generally this book will fulfil a need to know more about the world of computing in general. Large format with over 180 pages.

Published price £8.95
OUR PRICE £2.00

WRITING STRATEGY GAMES

If you are fed up with simple arcade style games but are not sure of the maths required in writing 'thinking' games like chess here is a book that will help you out. To write games of strategy requires not only a knowledge of programming but also of certain mathematical and coding techniques. This book is pitched at an intermediate level, assuming that you already know some Atari Basic. Machine code programmers are also catered for with many hints on how to modify the routines. The book covers the programming theory behind intelligent games before moving on to practical examples of setting up a chess board, moving pieces and playing through. There are sample games for draughts, chess and other strategy games.



Published price £5.95
OUR PRICE £1.50

LAPIS PHILOSOPHORUM

NEW!



One of the best graphic adventures released on the Atari which is suitable for all abilities. A mystical adventure set in a small country in which the King's step son has poisoned the King to gain the throne. The Magicians have failed to cure the dying King but can you? You will need to find the philosopher's stone among 83 different screens and with seven possible solutions.

Original Price £9.95

OUR PRICE £1.99

DISK ONLY

SKYWRITER



Help your children learn how to create complex words with a fun game that will keep them happy while they learn. A two syllable word is given and the child has to recreate that word from its parts which float across the screen on clouds. A simple concept but one which teaches in an interesting way. Suitable for ages 5 upwards.

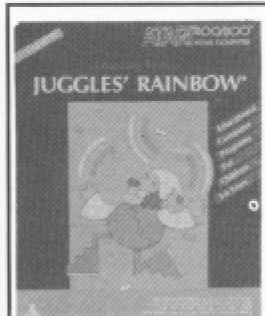
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Original Price £12.99

OUR PRICE £4.95

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JUGGLES RAINBOW



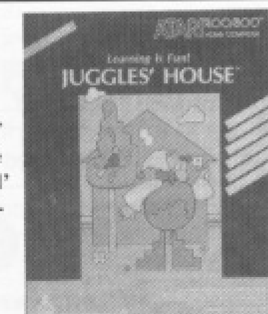
A first computer learning experience for children aged 3 to 6 that teaches the concepts of above, below, left and right plus letter recognition allowing the child to enjoy learning with colours and music and games they can create and play themselves.

OUR PRICE £5.95

NOW ALSO ON DISK!

DISK OR CASSETTE

JUGGLES HOUSE



Another for 3 to 6 year olds teaching the concepts of inside, outside, upper and lower with Juggles' House and Toyshelf. each game also includes a 'playground' where children can try out these new ideas for themselves.



OUR PRICE £5.95

SPECIAL OFFER - PURCHASE BOTH JUGGLES PROGRAMS FOR JUST £9.95

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CAVERNS OF MARS

Winner of one of the first Atari programming competitions, this was one of the first vertical scrollers and remains a much sought after original game. Descend through the caverns avoiding mines and picking up fuel. Highly playable and addictive, only one or two have made it to the bottom of the cavern to discover the secret that awaits them.

LAST FEW WITHOUT BOX BUT WITH FULL ORIGINAL MANUAL - LOWER PRICE

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TOUCH TYPING



Everyone who uses a computer needs to brush up on their typing and now you can learn to type like a professional typist with this complete tutorial. Touch Typing presents a self paced method of learning by letting you practice typing letters, sentences and paragraphs. The computer determines words per minute, number of errors and your weak points. Random sentences are generated to drill you in those areas. Contains two cassettes and instruction manual.

Previously £19.95.

OUR PRICE £4.95

CASSETTE ONLY

TIME and MAGIK



Three of Level 9's famous adventures in one package. This includes LORDS OF TIME, RED MOON and THE PRICE OF MAGIK to give you many hours of puzzle solving and exploration of the unique worlds created by Level 9. All these games have received top reviews. Now you can try them at a very special price

Originally £11.95

OUR PRICE £5.95

DISK ONLY

TYPO ATTACK



A typing trainer based on the Space Invaders concept in which you hone up your typing skills by blasting falling letters. An enjoyable way to learn that will quickly enable you to recognise the keys without having to look at the keyboard.

Normally £12.95

OUR PRICE £6.95

ROM CARTRIDGE

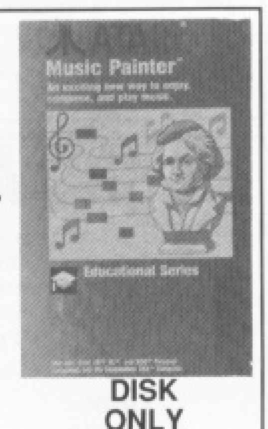
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The all round personal finance planner that keeps track of three bank accounts, maintains income records, reminds you of birthdays, anniversaries and important dates and generally keeps you up to date on your financial status.

OUR PRICE £6.95

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MUSIC PAINTER



An exciting educational program that helps to teach music by using colours instead of notes. Change the fifteen supplied songs to feature different instruments, make the notes longer or shorter or transcribe your own songs. No musical knowledge required to make your own great music. Children or adults alike will get great satisfaction from being able to create their very own music.

OUR PRICE £7.95

DISK ONLY

A Further Selection

More software for your added enjoyment ranging from adventures to arcade games and serious software. Check out Visicalc - we only have a few copies left!

PLANETARIUM

BACK IN STOCK!

Fun or education? Both really in this fascinating look at the heavens. Over 1200 stars, 88 constellations, the solar system and more than 300 deep-sky objects are depicted in this program that allows you to view the universe. You can make stellar and planetary maps, study eclipses, learn about latitude and longitude and much more.

1050 DRIVE ONLY
Please state when ordering if you have a US Doubler fitted

Normally £16.95
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TAIL OF BETA LYRAE

NEW PRICE

Our A-Z of Atari Software series says "The ultimate 'Scramble' clone with superb graphics and music. This humdinger of a horizontally scrolling shoot 'em up was written by Philip Price, and the music was by Gary Gilbertson. They later went on to write the 'Alternate Reality' games." This is one of the few original 'classics' right up there with the top arcade games of all time. Give your eyes, ears and reactions an unforgettable treat!

DISK OR CASSETTE

Original Price £7.95
OUR PRICE £1.99

KABOOM

NEW!

Challenge the Mad Bomber as he tries to bomb you out of sight. Can you catch his bombs and dowse them in time? Or would you like to be the Mad Bomber and try to flatten one of your friends? Lots of excitement for one or two players in this addictive arcade game that won awards for Best Audio and Visual Effects when it was first released. Simple yet addictive.

ROM CARTRIDGE

OUR PRICE £2.95

RIVER RAID

NEW!

This best-selling, all out battle adventure from Activision will have your palms sweating as you fly up river bombing enemy bridges, avoiding lethal choppers and hot air balloons. Can you survive far enough up river to discover its secret? Few can. Now this 1 or 2 player game can be yours at the lowest ever price. Bombs away!

ROM CARTRIDGE

Recommended price £12.95
OUR PRICE £3.95

ATARI SMASH HITS 7

NEW!

This is incredible! FOUR of the best games for the Atari in one pack at the amazingly low price of just £2.99. Are these sub quality games? No sir! Not with Colossus Chess 3.0, Electraglide, Blue Max and Alley Cat as the selection, any one of which would be a bargain at £2.99 but you get all four! You had better hurry!

DISK ONLY

Recommended price £14.95
SPECIAL PRICE £2.99

ZAXXON

NEW!

One of the all time classics for the Atari, Zaxxon set new standards when first issued and was copied many times. Pilot your craft across the unique 3 dimensional battlefield shooting enemy fuel tanks, anti-aircraft tanks and missiles before launching off through space for the ultimate conflict with a mighty robot - few have got this far! Zaxxon, often copied, never bettered and NEVER at this incredibly low price!

DISK OR CASSETTE

RRP £7.95 cass/£9.95 disk
OUR PRICE £2.99

SCREEN DUMP 1020

NEW!

Owners of the 1020 printer/plotter will be delighted with this utility which has been unavailable for a long time. Now AtariArtist pictures can be dumped to your 1020 in FULL COLOUR. Just boot up the tape, select your favourite picture and let the software do the rest.

CASSETTE ONLY

Originally £14.95 **OUR PRICE JUST £2.95**

TIMEWISE

REDUCED PRICE

Why not use your Atari as an electronic diary? Timewise allows you to keep track of all your appointments and important dates on a daily, monthly or yearly basis. Now you can dispense with your diary and let your Atari do the work. If you have a printer Timewise allows you to print out the information in a variety of ways.

DISK ONLY

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OUR PRICE £3.95

HOME FILING MANAGER/PAY OFF

DISK ONLY

The Home Filing Manager record keeping system that simulates index cards on your Atari, keeps track of almost anything together with The Pay-Off Adventure - your chance to sample an adventure in classic style. This two disk set also includes some top class graphics demos.

SPECIAL PRICE - ONLY £1

PROOFREADER

Users of Atariwriter will be delighted with this, the long lost spelling checker for the Atariwriter cartridge! Proofreader may be loaded alongside Atariwriter to give you instant access to a dictionary of 36,000 words. If that is not enough you can add your own words as you go. Errors are highlighted on screen for correction, unusual words can be saved and you can look up spellings.

DISK ONLY

OUR PRICE £5.95

MACRO ASSEMBLER

The Macro Assembler will allow you to create your own machine language games and applications five times faster than with the Assembler Editor cartridge and it can assemble as many as 1600 symbol definitions with no limit on program size. You can duplicate code, optionally assemble code and modularise your program. A Program-Text Editor is included.

DISK ONLY

Normally £19.95
OUR PRICE £7.95

BASIC CARTRIDGE

Why would you want a Basic Cartridge when Basic is already built in to your machine? Well some programs, especially some early public domain programs won't run on the XL/XE but they will if you plug in the old version of Basic. Much more convenient than having to boot in the old Basic from disk and, at this price, worth having just as a backup.

ROM CARTRIDGE

OUR PRICE £3.95

PIRATE ADVENTURE

"Yo ho ho and a bottle of rum ...". You'll meet up with the pirate and his daffy bird along with many strange sights as you attempt to go from your London flat to Treasure Island. Can you recover Long John Silver's lost treasures? Happy sailing matey. Scott Adams Graphic Adventure #2 brings you a superb Beginner's level adventure complete with graphics and ideal for all ages

DISK ONLY

Original price £19.95

OUR PRICE £7.95

STRANGE ODYSSEY

At the galaxy's rim, there are rewards aplenty to be harvested from a long-dead alien civilization. Fabulous treasures ... advanced technologies far beyond human ken ... All this and more awaits the brave galactic Adventurer. But will you be able to recover the wealth and return home? Prepare yourself for a Strange Odyssey! Scott Adams Graphic Adventure #6 is a Moderate level adventure.

DISK ONLY

Original price £19.95

OUR PRICE £7.95

HARDBALL

American League baseball at it's very best. A highly regarded game - check out the review in Issue 45 'THE best sports simulation on the Atari'. Look over the pitchers shoulder as he throws the ball to the waiting trio of batter, catcher and umpire. In HardBall you can hit, run, steal, blunt and dive, change the fielders and do everything you can do in the real game. For one or two players.

ROM CARTRIDGE

Normally £14.95

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GALAXIAN

Another arcade conversion that retains all of the addictiveness of the original and still stands as one of the all time classics. Blast the galaxians as they advance in formation and peel off to attack. With one or two players and 10 skill levels you'll be entertained for a long time. Includes an easy option for beginners.

ROM CARTRIDGE

Normally £12.95

OUR PRICE £6.95

STAR RAIDERS II

Disk version of this follow up to the greatest computer game. Your mission is to pilot the hottest fighter in the galaxy - the Liberty Star - to destroy the entire Zylon Master Force. Your weapons are: Pulse Lasers, Ion Cannons and Surface Star Bursts. Warp between two systems, protecting friendly bases whilst dropping Star Bursts on the enemy. More great action in Star Raiders fashion.

DISK

Normally £14.95

OUR PRICE £5.95

U.S. FOOTBALL

SOLD OUT

American Football is now a big craze in this country and you can now play at home. Outsmart the defence, pass with amazing accuracy, run with speed and agility, make tackles, select offensive and defensive plays and more. You can take on the computer in a practice game or challenge a friend to a dramatic video bowl game of your own in a packed stadium. All the thrills of the gridiron.

ROM CARTRIDGE

Normally £12.95

SOLD OUT

JOUST

Don your helmet and hoist your lance and climb aboard an ostrich in this unusual arcade game! Do battle with the evil Buzzard Riders in deep space. Pterodactyls to the right of you, alien eggs to the left, you must learn to fly so that you won't die so very far from home. All the arcade thrills for one or two players.

ROM CARTRIDGE

Normally £12.95

OUR PRICE £6.95

RESCUE ON FRACTALUS

Ask old hands what was one of the best games ever for the Atari and a good proportion of them will say Rescue on Fractalus. This game from Lucasfilm set new standards in computer games combining a space flight simulator with a rescue mission. Super, ever changing, 3-D scenery as you fly through the mountains to land on the planet and rescue stranded pilots.

ROM CARTRIDGE

Normally £14.95

OUR PRICE £6.95

BALLBLAZER

Another from Lucasfilm, this top quality split screen game takes place in a games arena of the future. You are strapped into a Rotofoil hovercraft-like vehicle that skims over the surface of the playfield at 50 metres per second. The object is simple, just release your Plasmorb through your opponent's goal. Two-player simultaneous play with first person perspective for both players.

ROM CARTRIDGE

Normally £14.95

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SUPER BREAKOUT

Breakout was the original simple yet totally addictive game and this enhanced version will provide even more addictive fun. Several variations on the basic theme are available for one to four players (up to 8 on the 400/800!). NOTE that this game requires paddle controllers.

ROM CARTRIDGE

Normally £9.95

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STAR RAIDERS 2

The original Star Raiders is updated with better graphics and sound. Your job is to clear each sector whilst ensuring that the enemy do not overrun planets in another part of the galaxy. It will take skill in deciding which sector to warp to, can you afford to clear a sector or will you have to leave to defend a planet and return later! A great follow up to an all time classic.

ROM CARTRIDGE

Normally £14.95

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LODE RUNNER

Another classic, perhaps the best of all platform games. You are a highly trained Galactic commando deep in enemy territory. Your mission is to infiltrate all 75 of the enemy's subterranean levels to recover every last piece of gold. You are equipped with a laser drill pistol but you'll need cunning, speed and agility. Lode Runner includes a unique extra that allows you to create your own levels.

ROM CARTRIDGE

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OUR PRICE £7.95

TENNIS

Great sports fun either against the computer or another player, singles or doubles. Forehands and backhands, driving approach shots, angled volleys, overhead smashes and tricky lobs - they are all here. You control your position on the court and where you want to hit the ball. The electronic scoreboard dis plays the results. All the action without the sweat!

ROM CARTRIDGE

Normally £12.95

OUR PRICE £6.95

ONE ON ONE

Play basketball with two of America's top players in this great sports simulation which features realistic offensive and defensive moves, fatigue factors, hot streaks, a shot clock, even instant repay and a shattering backboard! Like the game of basketball itself, One-on-One rewards you for playing with your head as well as your hands.

ROM CARTRIDGE

Normally £14.95

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FIGHT NIGHT

BACK IN STOCK!

Fight Night brings you all the thrills of the boxing ring as you face five of the most brutal fighters ever. Its five separate battles are total war with relentless action. The Boxing Construction Set allows you and your opponent to create your own perfect boxers, selecting stamina, intellect and style. Step into the ring to pit your perfect boxer against the computer or another opponent. 1/2 players.

ROM CARTRIDGE

Normally £14.95

OUR PRICE £7.95

DESERT FALCON

A version of the classic Blue Max that finds you flying across the desert Indiana Jones style searching for hieroglyphics hidden in the desert sands. You need to survive long enough to destroy the howling Sphinx. The longer you survive and the further you proceed, the more perilous your mission becomes. If you destroy the Sphinx you get to gain the bonus round for even higher points. Four levels.

ROM CARTRIDGE

Normally £14.95

OUR PRICE £7.95

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ALL ITEMS FOR XL/XE

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	SUPER BREAKOUT	£ 3.95	
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ST FILE







DISNEY SOFTWARE

- some great looking graphics but do the games live up to their visual appeal? Turn the page and check out these and other educational programs for your ST

NEWS ... WHAT NEWS?

Checking through the usual pile of press releases we were surprised to find ... no press releases! Well, none of great interest. The new releases mentioned in the computer trade papers seem to be getting fewer and fewer, does this mean that the ST is going down the path that Atari have taken in the past or is this just a temporary aberration? Meanwhile thanks to John Sweeney for the following snippet on a new version of Tetris released by Infogrames.

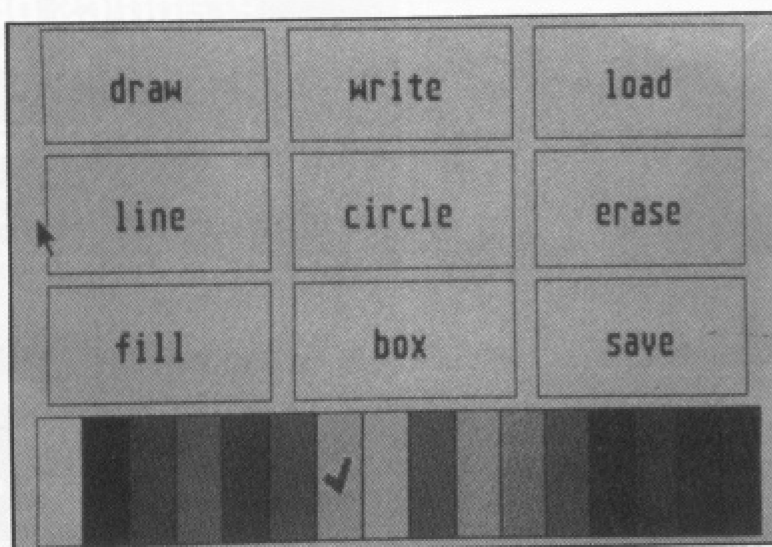
Infogrames have acquired the rights to TETRIS and have released a new version of the game at £19.99. Completely new sound and graphics, much better response to the controls, more challenge as it is 50% faster than the original and an option to start with random tiles at the bottom of the well to make life even harder for yourself!

CHUCK ROCK CHEATS

As promised in the review last issue here are some cheats for this great game courtesy of John Sweeney. If you are stuck then read on and play on!
On the title screen (second diskette) type TURN FRAME (lower case, but with the space) then press the fire button. Now when you get to the game you can press 1-5 to select which level you want to see. Other cheats: if you press ESC to return to the title screen you can also enter MORTIMER (activates F1-F5 as zone select within current level) or UNCLE SAMS (to get infinite energy).

Top to bottom ...
MICKEY'S RUNAWAY ZOO
DONALD'S ALPHABET CHASE
GOOFY'S RAILWAY EXPRESS

MANY DIFFERENT



LEARNING SOFTWARE REVIEWED by JOHN S DAVISON

HAT Software have been around a while now, but seem to have been keeping a fairly low profile. Perhaps that's changing though, as they recently sent me TEN of their products for review. Unfortunately I just don't have the space here to do a full review of each one, but I do want to mention them all so I've compromised by providing a brief description plus my overall opinion of each.

All the programs run on a 520ST/STE in low resolution, except the odd one which requires medium resolution. Each program is supplied on one single-sided disk, accompanied by a small instruction manual. These manuals are very disappointing - they concentrate purely on program operation, providing virtually no guidance on how to exploit the educational aspects of the programs and hence get maximum benefit from them. Most don't even tell you the program's purpose - and in the case of the first three described below it's not immediately obvious what that is, because of their rather specialised nature!

SPRINTER (£29.95) - a very unusual and specialised program aimed at students involved in fabric design. It's basically a pattern generator and can load a DEGAS PI1 format picture, cut a square block from any part of it, then replicate this in a regular pattern all over the screen. Horizontal or vertical offsets can be applied to shift the relative block positions, or you can manually "rubber stamp" the block anywhere you want on the screen. There's also a simple drawing facility so you can alter the block's contents first. When complete, your creation can be saved in PI1 format. The program also has a "colour stripping" facility, about which the manual tells you absolutely nothing. Apparently it's used for printing colour separation acetates used for transferring your pattern onto a fabric in colour.

***Verdict** - the computer side of it seems to work fine. I'd love to see the end result of the complete fabric printing process!*

COLOUR STRIP (£12.95) - similar to the colour stripping part of Sprinter, but works on any PI1 or Neochrome format picture file. Again, the manual says nothing about its intended application.

***Verdict** - as for Sprinter.*

COLOURS (£12.95) - another specialised utility. Early models of the ST/STFM have a bug which causes the printing of incorrect colours when screen dumping to a colour printer. This program loads a PI1 format picture; adjusts the colours so they'll print out as originally intended; then writes the adjusted file back to disk for later printing.

***Verdict** - No comment. I have an early ST, but no colour printer so I couldn't test its effectiveness.*

FIRST PAINT (£12.95) - a simple paint program, specifically aimed at very young children. Functions include freehand drawing; polyline; circle/ellipse; box; colour fill; and text - all in any of 16 colours - plus erase; undo; and screen wipe. Save/load use PI1 format, so the childrens' creations can be saved for posterity or passed to other HAT programs for further processing. Screen dumps to the printer are also supported.

***Verdict** - fine for its intended users, but rather expensive for what it is.*

STAGE II (£14.95) - a more versatile version of First Paint, with additional facilities including filled or outline shapes; rays; zoom and pixel paint; solid colour and pattern fill; airbrush; cut/paste; variable 16 colour palette; variable brush sizes; and load/save in PI1 or Neochrome formats. Also supports the VIDI-ST video digitiser, but again the manual says little about using it! Unfortunately I couldn't try it either, as I don't have access to one.

***Verdict** - the natural next step for children familiar with First Paint, providing comprehensive facilities while remaining easy to use.*

BLOWUP (£12.95) - this can load any PI1 format picture from disk, enlarge it, then print it out on an Epson compatible printer. Other makes (even colour printers) can be used, but the manual doesn't explain how. Printout size can be scaled from actual screen size up to 26 x 26 screen size, allowing giant posters to be made. The picture is printed in sec-

THATS

tions on separate pages, so you have to cut them out and glue them together to construct the poster. Printing giant posters eats printer ribbons, so ensure you've got spares handy!

Verdict *- works well, if a little slowly. Kids will love making posters of their creations!*

NOUGHT TO NINE (£14.95) - introduces young children to the concept of numbers. It contains seven different "games" which are based on pair matching, object counting, and number recognition. The pair matching games also help with memory development and are really four different levels of the same game. They follow the classic format - the child uncovers an icon and then locates its hidden matching twin from the selection presented. Single icons are used to begin with, so the child has only to match objects. It then moves on to multiple icons, so the child has to count them AND match them. The numerals 0 to 9 are then introduced, and finally icons and numerals are used together.

The other three games involve counting. "How Many?" involves a straight count of the icons displayed. "How Many More?" displays a numeral and the same number of icons and asks "how many more?" to make a given total. "How Many Less?" is similar but involves counting down instead of up. Answers are input via the keyboard or by mouse click on an onscreen number strip. No help is given for wrong answers, the child just retries until he gets it right, when he's rewarded with an animated display of bouncing icons. Ten correct answers is rewarded by a snatch of sampled music. You can customise the program by adding your own sampled music (via a separate Replay cartridge), and by designing your own icons with the supplied icon editor.

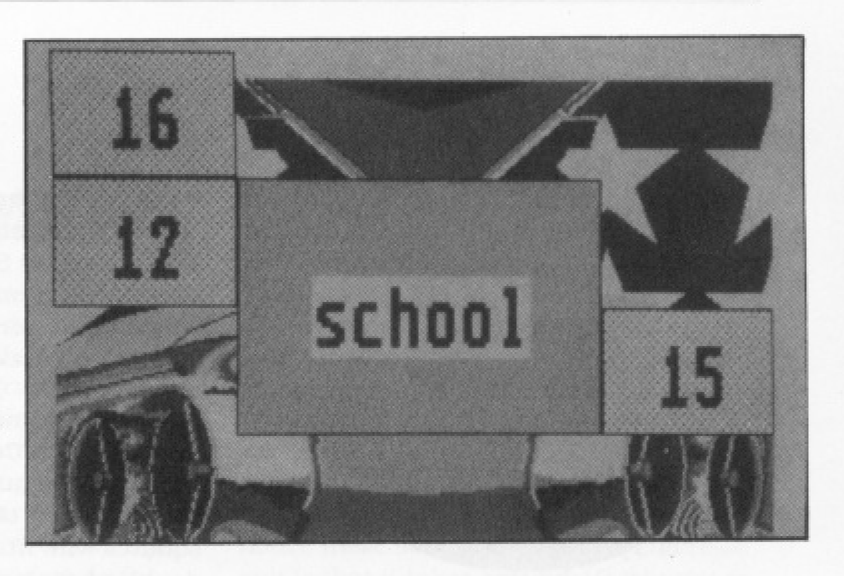
Verdict *- an easy-to-use "traditional" learning aid which young children should enjoy using.*

JIGSPELL (£14.95) - designed to help with spelling. It displays a numbered grid on the screen, each section of which covers part of a picture. A word is then displayed, which the child memorises then keys in after it's removed from the screen. A correct answer uncovers a section of the picture, so as the child progresses the picture is slowly revealed in jigsaw-like fashion.

Help is given and retries allowed if the child makes a spelling mistake.

Again the program can be customised. You can provide your own PI1 format pictures using FIRST PAINT, STAGE II, or other art program. Customised word lists can be built and stored on disk using the supplied word list editor.

Verdict *- a useful program, but younger children could get confused by use of lower case letters on the screen and upper case letters on the keyboard.*



FIRST TYPE (£14.95) - not a typing tutor, but a simple electric typewriter emulator. You can type a line of up to 80 characters onto the screen (with simple editing facilities available), then press Return to print it out. The ST's function keys are used to switch from normal font to bold, underline, italic, condensed, extended, NLQ, or certain combinations of these - assuming your printer can handle them. Screen display is non-WYSIWYG, so you can't actually see the different styles until they're printed out. Default support is for Epson compatible printers, but a supplied utility allows virtually any other make to be supported. There's no save/load facility as the program is emulating a typewriter, not a word processor.

Verdict - very easy to use, useful for keyboard familiarisation and simple typing - without the complications of a word processing program.

LEARNING TO TYPE (£14.95) - IS a typing tutor! It starts by displaying a colour coded keyboard diagram showing which fingers are used to press which keys. Graded and timed typing exercises follow, during which you can optionally view a (different) keyboard diagram as a visual guide. You have to key in a "text stream" which scrolls across the top of the screen, with the characters of the current word displayed in appropriate keyboard/finger colour codes - a nice feature. On completing an exercise you're told your typing speed in characters and words per minute and your accuracy in percentage terms. The keyboard diagram can be replaced by any PI1 format picture. It isn't displayed immediately, but is revealed a strip at a time as you correctly key in the text stream. Using the supplied editor it's possible to provide your own customised text streams to supplement those provided. There's also a game option in which you disable incoming missiles by quickly (and accurately!) typing in their displayed identification codes.

Verdict *- again, a useful program which achieves its aims without fuss.*

OVERALL IMPRESSIONS

These programs cover a very wide range of educational applications and HAT are to be commended for supplying this difficult part of the market - especially for providing such unusual utilities as Sprinter and Colour Strip. I know these are of limited interest, but it does demonstrate innovative use of the ST, opening up a whole new field of educational possibilities.

I particularly liked the way PI1 picture files can be interchanged between various programs - the kids will love seeing their computer artwork in poster form, used as background pictures in other programs, or even ending up printed on fabric! Overall graphical presentation of the programs can really only be described as adequate, and could do with livening up somehow. The same applies to the use of sound. Also, it's a pity HAT don't standardise the user interface across all their programs - and make them a little more intuitive to use while they're at it. And those awful manuals really do need a major overhaul!

In summary, HAT's programs are definitely worth considering, especially if you need the more unusual functions they provide. However, the less esoteric programs have more competition, so although they're generally quite good, you may want to compare them with other similar products before parting with your hard earned cash.

TRADITIONAL BOARD GAMES ON YOUR ST

Part 1

Played any OLD games on your ST lately? No, I don't mean Pacman or Space Invaders! I mean REALLY old games like Sen't, Merels, Wei-ch'i, Chaturanga, Hneftafl or Rithmomachy! What, you have never heard of any of them?

Well, Rithmomachy was a French game from the 12th Century (yes, the French were just as crazy back then!) which involved moving circles, triangles and squares with numbers on them around a double chess board. Rithmomachy means "the battle of numbers". For example, a piece x which could make a legal move of n squares onto a piece x*n could take it by multiplication! Winning involved arranging your pieces into arithmetic, geometric and harmonic progressions. The game died out ....

Fortunately most of the rest survived and have evolved into modern games of which you will certainly have heard - the Egyptian Sen't became Backgammon; Merels was played everywhere and turned into games like Noughts and Crosses or Nine-Men's Morris; the ancient Chinese Wei-ch'i was adopted by the Japanese around the 6th Century AD and became known to the Western world as Go; the Indian Chaturanga spawned many diverse variations of Chess including the version YOU know (mind you they were still arguing about details - like how far a king could move when he castled - in the 17th Century!); Hneftafl was a Norse game, interesting in that the sides were completely unbalanced and had different objectives - the good guys were always supposed to win - which could explain why that died out as well!

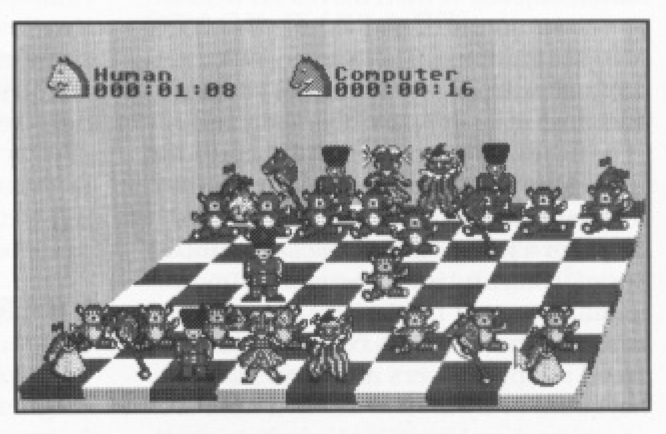
So what's this got to do with computers? Well, you can play all of the ones that survived against your ST, and that is what this article will eventually be about. But before we get to that, here is a hint for anyone trying to think of a simple game to program onto their home computer: nip down to your local library and have a look for *"A History of Board Games"* by H.J.R. Murray or *"Board and Table Games from Many Civilisations"* by R.C. Bell. If you skip through the boring bits you will find the rules for literally hundreds of simple board games which PAGE 6 would, I am sure, be delighted to publish or put into the Public Domain Library if you would care to program them!

So, let's start with Chess. If you haven't got a Chess program yet for your Atari then I can thoroughly recommend both **COLOSSUS CHESS X** and **CHESS CHAMPION 2175**. Both are excellent chess-players and crammed full of extra features to make them good value for money. The credits for Chess Champion claim that it is the "World's Strongest Chess", but since they also claim that it was written by the "Most Modest Programmers" we should probably take that with a pinch of salt! What is certain is that both programs are right up there at the near Candidate Master level and will give anyone but the top few players in the country a good run for their money, and despite the Champion's claims I would not like to say which is the stronger at any particular setting.

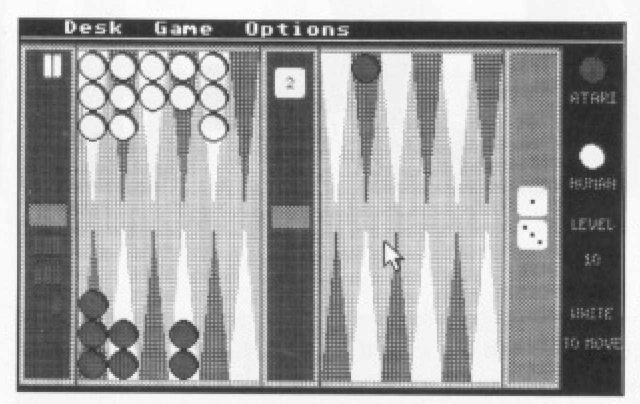
Of course, you may be looking for a Chess program which you can beat (we all need a moral boost from time to time!). Fortunately both games offer this option as well, but in different ways. Despite Champion's claim to have the weakest low - achieved by selecting Orangutan level, which plays virtually randomly! - it failed to lose against Colossus's option of "Play to Lose"! Colossus kept putting its pieces where they could easily be captured, but Champion, playing randomly, nearly always missed them! However, it is virtually impossible for someone playing randomly to actually achieve checkmate, so Champion couldn't WIN either - the result was a DRAW!

I did like Colossus's "Play to Draw" option which deliberately makes mistakes if you are losing badly, so that you can catch up again - provided you take advantage of them!

As if they aren't strong enough already, both Champion and Colossus will automatically learn from their games with you and update their libraries of opening moves. Both will also allow you to add your own openings as well. A nice feature of Champion is that if you play a standard, named opening or defence it will display the name on the screen for you.



Both provide multiple views of the board and multiple sets of fancy chess pieces - nothing like BattleChess of course which is not as good a chess-player, nor so full of features.



Pictures - left Chess Champion 2175, above Atari's BACKGAMMON, right BACKGAMMON ROYALE

Uniques for Colossus include an option to play blindfold, optional classical background music, "show legal moves" (good for beginners), full tournament parameters (first and second controls and times), "All the Moves" mode (so you can play lightning chess with a time limit), a problem solving mode (and some problems for you to solve) and 29 of the best human vs computer struggles since 1951 for you to review.

Uniques for Champion include intuitive fast move entry (click on a square or piece and it will guess which move you want to make), "What if?" (allows you to enter the next few moves and Champion will then tell you what it thinks would happen if you did that), "Your Grade" (will test you with a series of Chess problems and tell you your ELO grade) and a Pause option in case the phone rings!

What neither of them has is my favourite chess program feature from a game I used to play back in the sixties! If you were losing badly you could press a key which made the board tip over and all the pieces fell off and disappeared through the bottom of the screen! Completely pointless, but very therapeutic!

Two excellent programs - I leave you to make your own choice about which extra features you prefer. Of course, if you don't need any of those extra features, you aren't too good a player, you haven't got a lot of money and you don't mind being told "Mittlere Auflosung Einstellen" (select medium resolution!), then you could always get the German Public Domain version for only £2.95 (including other goodies such as Backgammon and Monopoly)! It is on Page 6 diskette ST27 and plays quite a reasonable game.

As a final comment on chess games you might like to know that Infogrames' Chess Simulator, reviewed last issue, is actually the previous version of Chess Champion 2175; the Simulator is the 2150 version licensed from Oxford Softworks' parent company CP Software.

BACKGAMMON

Enough about Chess! I just mentioned that you can get a Backgammon program for only £2.95; as with the Chess program on that diskette, the Backgammon program is fairly low on features: no doubling cube, no changing your mind halfway through your move (which is actually legal), no choice of style or strength of play, in fact no features at all! But it will give you a reasonable game of Backgammon!

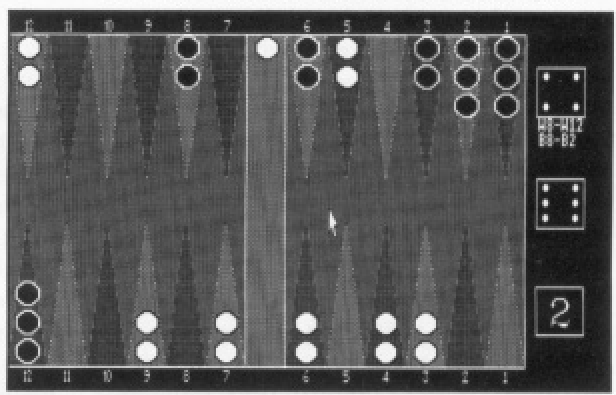
Of course if you would like something a little more sophisticated you again have a choice - Atari do a **BACKGAMMON** in their Mindgames Series, and Oxford Softworks do **BACKGAMMON ROYALE**. Both games provide an explanation of how to play Backgammon (unlike the PD version!); the Atari description is perhaps a little more helpful for the beginner and includes some recommended openings, but there are plenty of good books on the subject if you want to go deeper into the game.

Just in case you don't know - Backgammon is a gambling game, a race to get your 15 men off the board before your opponent. You move, according to dice throws, in opposite directions around the board, and if you manage to land on a solitary enemy piece (known as a blot) you send him all the way back to the beginning! A very important extra dimension is added to the game by the use of the Doubling Cube - at any time you can demand that your opponent must choose between resigning or playing on at double the initial stakes! This is a modern innovation which brings a psychological element to the game, and, while the computer is not necessarily very good at human psychology, at least both versions implement Doubling fully so that you can get practice at it.

Both versions play quite a strong game, though if you are already an experienced and strong Backgammon player you may find that you can win quite regularly against either of them even at their strongest levels. Sadly neither of them seem very good at either playing or defending against a Back Game (this is an advanced strategy whereby a good player, having taken some risks which failed to work out, starts to deliberately get his men sent back so that they can harass the enemy more effectively - this seemingly suicidal technique can show amazing results if played well!).

The Atari Backgammon is probably best for beginners as you can set its playing strength from 1 to 10. Levels 1 and 2 are specially designed to be easy for those who are learning how to play Backgammon. Its main weakness is that, although it only takes 2 or 3 seconds to decide on its next move, it can take up to 10 more seconds to actually make it as it insists on flashing the dice and moving the pieces very slowly to their destinations. I was looking for a way to speed it up before it had finished its first move - sadly there is none - don't games testers notice these sort of things? The end result is that it takes around 10 minutes to play a game that Royale can play in 5 minutes.

Royale moves its pieces at a sensible speed (though you can slow it down if you are a beginner!) and generally has a slightly friendlier user interface (though neither are perfect!). The only place where Royale may fall down is that it has no easy levels. It provides two opponents for you (who presumably play with different styles) and it chooses randomly be-



tween them for each game; it also allows you to select whether you wish it to play aggressively or defensively. But it always plays at its best so a beginner may get a little frustrated.

More Ancient Games next issue: Bridge, Go-Moku, Shanghai and the best of them all - GO!

by John Sweeney

COLOSSUS CHESS X (CDS Software) - £24.99
CHAMPION CHESS 2175 (Oxford Softworks) - £30.60
BACKGAMMON ROYALE (Oxford Softworks) - £26.28
BACKGAMMON (Atari) £24.99
PD DISKS from the Page 6 Library - £2.95 each

HEY, MICKEY - LET

Products bearing the Disney logo are usually of high quality, so I was looking forward to trying out these Disney based educational programs distributed by Nathan Software. The three programs under review are aimed at children in the 2-5 years age group, and cover the basic concepts of numbers and counting; letters of the alphabet; and colours and shapes. Each program runs in colour on any ST/STE and is supplied on one single sided disk. The accompanying instruction booklets aren't as comprehensive as they first seem as they cover several different computer formats. Each one includes ideas for additional activities based on the programs though, very useful with software of this type.

As you'd expect the packaging is attractive, but does carry some rather misleading information. Each box has a promotional flash on it saying "free Disney gift inside". In fact, you have to collect stickers from several different programs in the series and send them off to get your "free" gift! That's very sneaky, Nathan Software!



Write out one hundred times "I must not mislead customers".

MICKEY'S RUNAWAY ZOO

This program helps children learn about numbers and counting. The scenario has Mickey and Goofy looking after a "petting zoo", but Goofy accidentally let all the animals escape. They're now hiding in various places, so our two chums (with your child's help) have to find them and return them in their waggon to the zoo.

There are only four screens, and these depict a cake sale(!) in the park; a city street scene; a suburban street scene; and the beach. The basic scenery also incorporates four or five large numerals, sometimes lightly disguised as part of that scenery. The numerals mark the animals' hiding places, and they flash in turn, so the child can easily see them. Also, if you watch carefully for a while, various animals will occasionally peep out from their hiding places!

Press a key corresponding to one of the numerals and that number of animals will emerge from hiding and happily climb aboard the waggon. For instance, pressing a 3 persuades three toucans to fly one-by-one out of a tree and into the waggon. A counter above its door increments as each animal enters, so the child can count along with it. By working through the numerals on the screen all the missing animals can be found. Re-keying a numeral for animals already located causes them to peek out of the waggon, so the child can count them again.

All numerals on one screen have to be selected before the program moves to the next. The booklet says you can "flip" to any screen by pressing an arrow key, but this didn't work on my copy. Neither did the sound on/off toggle. After completing the fourth screen, you see Mickey, Goofy, and the animals reunited at the zoo, after which the program restarts from the beginning again.

The scenery graphics are big, bold, and colourful in typical Disney style. The animation of the animals is handled well too, some of it in a way that's guaranteed to make you smile! However, although Mickey and Goofy are excellently drawn, their animation is minimal. One odd thing is that their mouths move in time with the counting of the animals, but no sound emerges. They also laugh soundlessly at the completion of each screen. It looks for all the world as if there should be sampled sounds here, but there's nothing. Also, the music just fizzles out part way through the fourth screen, so you complete it in total silence! This, plus the non-functioning toggle and flip controls mentioned earlier give the program a distinctly unfinished feel!

Overall, I was very disappointed by Mickey's Runaway Zoo. The graphics are cute, but there's not enough of them. Four simple screens, skimped sounds, and functions that don't work for £24.99 is poor value in my book, so I can't honestly recommend it.

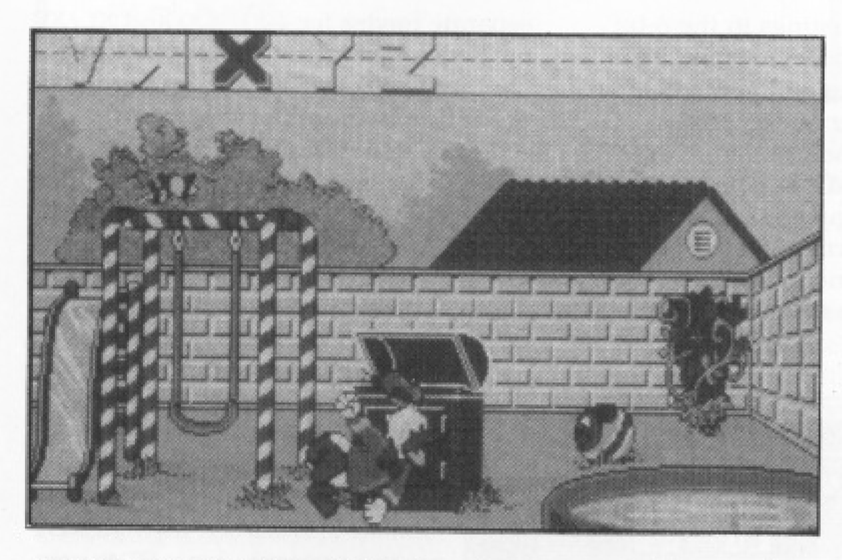
DONALD'S ALPHABET CHASE

We move on to learning about letters of the alphabet with this program, by helping Donald Duck find his "alphabet pets". They're roaming around his house and garden, represented by six different screens. Across the top of each is a rack showing several alphabetic letters in outline form. One of the letters flashes, and an animated "characterised" version of it pops out of hiding and leads Donald a merry dance around the screen. The child has to find and press the matching key on the ST's keyboard, which allows Donald to catch the wayward letter and hurl it up into the rack where it belongs. The letter's outline is then replaced by solid colour, so you can easily see which letters have been caught.

The antics of Donald and the letters are very amusing and great fun to watch, with letters jumping out of dustbins, popping out of the bath, scooting across the floor on soap, and so on. But there's one slight snag. The letters are all shown in UPPER CASE! Although this means they match the keytops of the ST's keyboard, children generally learn lower case letters first at school, so this program could actually confuse them!

Like Mickey's Runaway Zoo the graphics are handled well, but the animation does seem a mite skimped - it's slow and jerky in places. Once again, the control for

ET'S PLAY!



sound toggling didn't work, but moving from screen to screen did this time.

The sound is handled differently in this program. The title music is a jazzed up version of the "Alphabet Song", using sampled sound by courtesy of Microdeal's Quartet sample sequencer. However, ordinary internal chip sounds are used on the main screens. At the end of each screen Donald's mouth moves as if he's singing the Alphabet Song, but all you hear is a weedy single voice chip sound. Why couldn't they have used sampled sounds of Donald's voice? The subject cries out for it!

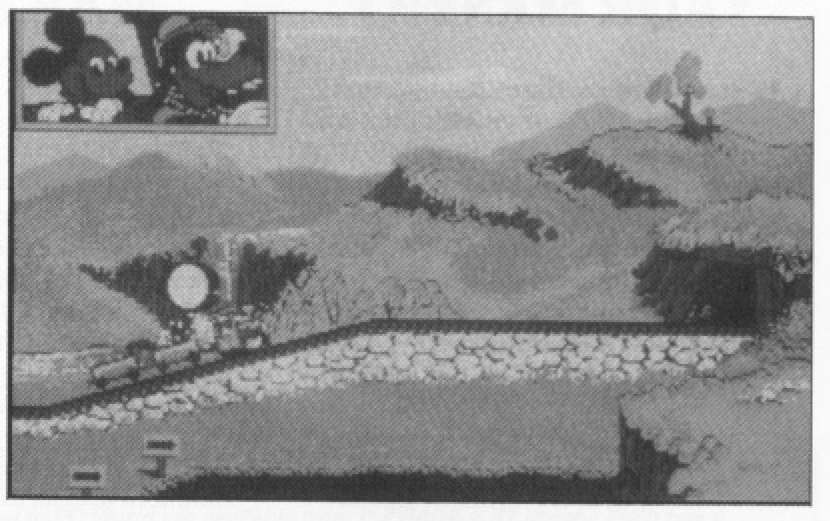
This program is better value for money than Mickey's Runaway Zoo, but I don't think it should have been centred around upper case letters. Surely the designers could have used lower case, even if it meant replacing keyboard input with an onscreen letter display and mouse selection (pun intentional!), as in other programs of this type now on the market.

GOOFY'S RAILWAY EXPRESS

The third Disney package is designed to teach your child about colours and shapes. It involves helping Goofy drive his train through a colourful and scenic landscape, taking Mickey along for the ride. The train is quite small, so to ensure you get a good view of the Disney characters there's an enlarged inset frame on the screen showing them in close up. There are seven screens to travel through, each one depicting a different scene, including a river crossing; a desert scene; and a couple of stations - more of which anon. The train travels continuously through the screens, turning round and doing the return journey after the seventh.

The engine puffs out clouds of black smoke, each cloud containing a coloured geometric shape. By pressing the ST's spacebar the child can get Goofy to toot the engine's whistle, which magically changes the geometric shape into one of a wide variety of animated objects. This is then positioned appropriately in the landscape by the program.

Passengers wait at the stations, and these are either Donald, Uncle Scrooge, Daisy, or Pluto. Above each passenger is a different geometric shape, and if you want Goofy to pick up a passenger you have to watch out for a matching shape to puff out from the train's smokestack. Pressing the spacebar then causes the train to stop, the appropriate character will get aboard, and appear with Mickey in close up in the inset frame mentioned earlier.



The graphics are of similar standard to the other two programs, i.e. colourful, attractive, and with reasonable animation. Disappointingly, the music has been recycled from Mickey's Runaway Zoo - more corner cutting? The train whistle sounds rather good, but the engine noise is poor - it sounds more like an old petrol driven motor mower than a steam engine! Yet again the sound couldn't be turned off, despite the comments in the instruction booklet.

I thought this program was the best of the three, but I still can't consider it particularly good value for money at £24.99.

OVERALL VERDICT

The concepts behind these programs are fine, they'll undoubtedly do the job they're designed for, and the kids will love them. However, I can't help feeling they rely far too heavily on the "cuteness factor" of the graphics and animation, to the detriment of the overall content. Other areas don't come up to the same standard, and there's evidence of corner cutting and skimping, particularly in the sound department. I got the distinct impression I'd been given short measure, particularly with Mickey's Runaway Zoo. Just compare it with any of Database's superb Fun School series of programs to see REAL value for money - Runaway Zoo is more like one section of any of the Fun School packages. In my opinion these Disney programs aren't really worth their asking price, so if you're interested in buying them make sure you see them before parting with your hard earned cash - just in case you agree with me!

MICKEY'S RUNAWAY ZOO
DONALD'S ALPHABET CHASE
GOOFY'S RAILWAY EXPRESS
Nathan Software £24.99 each
Reviewed by John S Davison

PD WORLD

Paul Rixon's

ST users have at their fingertips one of the most flexible personal computer systems in the world (well, probably!). Not only is the ST supported by hundreds of software applications, MIDI instruments, DTP bureaux, dedicated magazines and enthusiastic users (not to mention excellent public domain software libraries!), it's also very fortunate in having attracted a wide variety of third-party expansion options. For example, with the addition of some relatively affordable hardware add-ons, the ST can be transformed into an IBM PC or an Apple Macintosh - so bringing two whole new worlds of computing to your desk-top.

ONE MACHINE OR MANY?

PC emulation on the ST has evolved from humble beginnings with Robtek's somewhat less than stunning 'MS-DOZ' software emulator to the dependable (but desperately slow) 'PC Ditto' and, more recently, to an ever-improving selection of powerful hardware devices offering increasingly comparable performance to the 'real' machines (incidentally, if Condor are looking for someone to review their new 286 Supercharger, I'd be very happy to oblige!). Macintosh emulation has similarly developed into a highly advanced state, with the brilliant Spectre GCR, complete with built-in Apple ROMS, offering a genuinely realistic alternative to the considerable expense of purchasing an original Mac.

As if all this isn't exciting enough, you can even convert your ST into an Atari 8-bit! Now THAT'S more like it! How many PAGE 6 readers sold their beloved 400s, 800s, XL's and XE's to invest in a 16-bit alternative, only to rue the day? Besides, wouldn't it be nice to make use of all those type-in listings in the 8-bit section, and to get down to some real programming once again? Well you can, with a small number of exceptions, thanks to an extremely clever program called **ST XFORMER**. The good news, as you might have guessed, is that it won't cost you an arm and a leg since the disk is shareware and available at the usual nominal price from the PAGE 6 ST Library.

Get ready to make your ST an XE!

MAKE IT AN 8-BIT ATARI!

When you boot up the disk you're initially greeted with various notices and a GEM menu bar providing a variety of options. The truth is, however, that the majority of these options don't do a great deal as they are intended for "future enhancements", such as support for Commodore 64 (yuk!) and Apple II emulation modes. Unfortunately (though not unexpectedly) the respective companies have not exactly been keen to allow PD programmers access to their operating system source code! The system does include a useful help menu to aid you in getting started - if you get really stuck there's a liberal amount of documentation supplied on disk. You probably won't need to refer to this much, since running the emulator is really quite straightforward. First of all you may configure various aspects of the system to meet the requirements of the hardware or of the 8-bit software you want to run. There are separate modes for 400/800 and XL/XE machines and further selections to enable or disable BASIC, choose normal or specially enhanced floating point routines, RAM sizes from 32K to 64K (128K mode isn't supported), fast or normal disk speeds and alternative values for the Vertical Blank Interrupt. The latter selection is intended to increase the speed of the emulator, since VBI's take up around 3 or 4% of the total processor time on an 8-bit Atari.

Having confirmed the set-up, selected 'continue' from the menu and waited briefly for the usual 8-bit boot-up initialisation, the familiar blue screen with 'READY' prompt appears - your ST is now an 8-bit Atari! But does it really work like an 8-bit? Well, mostly yes! You can certainly write programs in Basic, PEEK and POKE memory locations, call up the Disk Operating System and run programs in the normal way - albeit at approximately 40% of the speed of a real 6502-based machine. The program appears to support player missile graphics (sprites to non-ex-8-bitters!) and most of the custom-chip hardware registers. The most notable features not currently supported are display list interrupts and the GTIA graphics modes. Also, the keyboard is based on the North American layout so UK users will find that a few keys aren't in the places they anticipated. It's important to bear in mind that the author doesn't guarantee his work to be absolutely bug-free - in fact he encourages users to point out problems and suggest improvements - so a fair amount of trial and error should be expected. Apart from the niggles already mentioned, the emulator is generally very well implemented.

You might be wondering how it's possible to use the 8-bit's 5.25" floppies with your ST - the answer is, of course, that you can't. Instead, **ST XFORMER** creates two 'virtual' disk drives (i.e. in memory) which can be loaded with virtual 'disks' or individual files from the ST's drive. The 'disks' are actually files on your ST floppy which are bit-images of a single density 8-bit disk. This means you can port over entire disks in one go from an 8-bit machine using suitable com-

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CURRENT NOTES MAGIC/SPECTRE COLUMNS
MARCH 1987 -- JUNE 1990

All of the Magic/Spectre columns printed in Current Notes from early 1987 through mid-1990 are included on this disk in three separate DOC files. Jeff Greenblatt authored this column from March, 1987 through February 1989. His column was entirled "Adventures in the Magic Sacdom." The column title was changed twice in 1988. "Magic Sac Update" appeared in June and then, with the appearance of the Spectre, the column title changed to "The ST/Mac Connection" in the October 1988 issue. Although the title changed, the contents were basically the same. Jeff's articles appear in two DOC files. The 1987 articles are found in MAGIC87.DOC. The 1988 articles and the last column, which appeared in February 1989, are found in MAGIC88.DOC.

Doug Hodson started his Magic/Spectre Tips column in March of 1989. His first 14 columns, from March of 1989 through June of 1990, are found in the file TIPS8990.DOC.

In addition to the column files, two DOC files, MAGICLIB.DOC and SPECTLIB.DOC, are available with a complete listing of the Magic and Spectre libraries. In both of these files, disks are first listed in

CURRENT NOTES MAGIC/SPECTRE CD PAGE: 1/7 <Help> on line

A couple of screen shots from THE CURRENT NOTES MAC COLLECTION - the disk contains a great reader as well as stacks of information

munications hardware and software, such as PAGE 6's TariTalk package. A utility called DiskComm is provided to create the 'disk' files on the 8-bit and another to copy individual files into 'disks' and vice versa on the ST. There's also a 'demo disk' containing DOS and a few other programs to help you get started. Don't worry if it sounds complicated - it is a bit, but the instructions explain everything you should need to know.

Finally, a note on system requirements. ST XFORMER will run in medium resolution or mono, but requires at least one megabyte of memory. There's a 'junior' version for 520ST users available from some sources and, indeed, the **XE EMULATOR** disk in the PAGE 6 library contains an earlier example of the ST XFORMER that will also run in 512K. However, be warned - it's not exactly glitch free!

EVEN A SPECTRUM!

If you were brought up on lesser micros, or want to find out how lucky you were not to have been brought up on them, the **SINCLAIR ZX81 EMULATOR** will, as the name makes obvious, turn you ST into a stunningly powerful ZX81! Unfortunately the instructions are in German but even if you've never seen one of Clive's curious creations before, you won't need a Masters degree in computer science (or German) to work out the basics. Once you're in emulation mode, the 'Help' key pops up a useful template of the commands assigned to each key (on Sinclair machines you don't have to type in all the commands explicitly, of course). There are thirty ZX81 files on the disk to experiment with, so it's just a case of hitting 'J' for load (obvious, eh?) and entering the filename. You don't even have to remember the filenames, as you can simply enter two quotes after the load statement (i.e. load "") to invoke the standard Atari file selector. Brilliant and amazing are definitely NOT words you would use to describe the ZX81 software supplied (indeed, any ZX81 software!). You can choose from games such as 'break the block' and 'race the blocks around the other blocks' and 'fire the block over the pile of blocks' - just as you would expect from the world's most joked-about micro! There's no denying, however, that the German authors have produced an extremely good emulator. It's fun too!

THE MORE SERIOUS USER

For those who've already invested in a Macintosh emulator, there's a whole bundle of hints, tips and advice (for Magic Sac and Spectre users) on a disk called **THE CURRENT NOTES MAC COLLECTION**. It comprises a handy 'reader' program featuring dozens of options to let you view, search, print and generally play around with the screens of information, together with a series of relevant articles from the US publication Current Notes. The reader could also be used for disk newsletters and similar applications.

Talking of disk newsletters (or magazines), did you spot that a new issue of **ST NEWS** was recently added to the PAGE 6 library? Issue 6.1 is dedicated to the ST News coding convention which was apparently held just before Christmas 1990, at Oss in The Netherlands (why weren't we invited!?). As well as containing the usual selection of articles (mainly reporting on the various days of the convention), artwork, music and other goodies, the disk is filled with a series of excellent competition demo screens submitted by visitors to the convention. There are even fully playable versions of Jeff Minter's 'Gridrunner' and the all-time classic 'Defender'. This lot is guaranteed to keep you occupied for much longer than a while - but let's hope this edition of ST News, which everyone thought was dead and gone, won't be the last.

OFF TO PLAY

You might have noticed that many recent additions to the PAGE 6 library have been games - this isn't a deliberate policy but rather a reflection of the enormous number of PD games that have become available in recent months. In the coming few weeks I'm going to try them all out (it's a hard life!) so next issue is earmarked to be an 'entertainment special'. See you then!

HOW TO GET THEM

All of the disks featured in PD World are available from the PAGE 6 ST library. Each has a unique reference code which you should use when ordering or making enquiries. Please contact PAGE 6 if you don't have a copy of their Accessory Shop leaflets and check the system requirements for each disk. THE PAGE 6 CATALOG DISK containing a full list of disk names and contents is available from the library, priced at £1. The disks referred to in this article are:

ST87 XE EMULATOR
ST260 SINCLAIR ZX81 EMULATOR
ST426 ST XFORMER
ST490 ST NEWS 6.1
ST506 THE CURRENT NOTES MAC COLLECTION

Prices for standard disks are £2.95 each or £2.50 each for ten or more
Write to PAGE 6, P.O. Box 54, Stafford, ST16 1DR
Telephone 0785 213928 or FAX 0785 54355 with credit card orders

SAMPLE THIS!

John S Davison explains the technical side of sampling and looks at a good low cost sampling package to get you started

In the last issue we looked at the basic nature of sampled sound and how a computer can be employed as a form of digital sound recorder. This time I want to look a little closer at the process, examining the two main parameters governing the quality of the replayed sound, namely, the sampling rate and resolution of the hardware used.

The sampling hardware "takes a reading" of (or samples) the analogue signal waveform voltage at regular intervals and converts each reading into a numeric data item a digital computer can handle. So, if samples are taken every millisecond then 1000 data items per second are produced, and the process is said to have a sampling rate of 1kHz (kiloHertz). A link between sampling rate and recording accuracy was established by a gentleman called Nyquist, who concluded that the highest analogue sound frequency that can be recorded accurately by such methods is ONE HALF of the sampling rate, and this frequency is known as the Nyquist limit.

In our example above the Nyquist limit is only 500Hz, which isn't very high. Low-fi "transistor AM radio" quality music contains frequencies up to about 5kHz, so achieving this requires a sampling rate of 10kHz. Similarly "mid-fi" sound extends to about 10kHz, requiring a 20kHz sampling rate. True hi-fi involves sounds up to 20kHz and above, demanding a sampling rate in excess of 40kHz. This is why Compact Discs (which use exactly the same sampling concepts) have a standardised sampling rate of 44.1kHz.

You've probably already spotted the snag! Higher fidelity requires higher sampling rates, which generates more data per second, and this has to be stored somewhere. Sampling is one of the biggest memory guzzlers you're likely to meet! If each data item generated takes just one byte, then a sampling rate of 32kHz gobbles 32K of your ST's available memory for EACH SECOND of sampling time. CD quality stereo samples take 10MB for EACH MINUTE of recording time!

Attempts to record sounds containing frequencies above the Nyquist limit for the sampling rate in use results in unpleasant distortion in the recorded sound, known as "aliasing". The only solution is to filter out frequencies above the Nyquist limit from the incoming analogue signal before they get sampled. Most sampling cartridges for the ST have some sort of "anti-aliasing" filter built into them, giving reduced distortion at low sampling rates.

RESOLUTION

The original analogue signal can take literally ANY value between two limits, so has an infinite number of possible values. For instance, signal voltages could swing between -2 and +2 volts overall, but at a given instant could have any intermediate value, e.g. +1.25764545 volts. Storing data with this accuracy takes many bytes to represent just one value, and even at intermediate sampling rates the amount of memory required to sample sounds would be prohibitive. So, a compromise has to be made.

Each data item is allocated a given number of storage bits, this number being known as the "resolution" of the system. Accordingly, it has a limited number of possible values, e.g. 4 bits can represent 16 values, 8 bits gives 256 values, and so on. The overall voltage range of the analogue signal is divided by the number of values available, so a small RANGE of original analogue values gets represented by a SINGLE digital value. A smoothly varying analogue signal is therefore represented digitally as a number of "steps", a process known as "quantisation". This introduces another distortion into the sampled sound, known as quantisation error. It's reduced by making the steps smaller, which requires higher resolution (i.e. more bits), which again requires more memory!

Another aspect of resolution is "signal-to-noise-ratio", i.e. the background "hissiness" present in a sample. Each bit in the resolution improves the situation by about 6dB (decibels), so an 8-bit sampler performs at around 48dB, about equal to a low quality cassette recorder without Dolby. The more expensive samplers use 12 or 16 bits, giving results similar to good quality Dolby cassette, and CD quality respectively.

So, top quality sampling requires a high sampling rate and high resolution, which is why CD's work at 44.1KHz with 16 bits, of course. Sampling equipment at this level of quality costs a fortune, so I won't dwell on it here. You can have a lot of fun with much simpler (and cheaper!) equipment though, and it's this I want to consider now.

SHOESTRING SAMPLING

One of the lowest cost samplers around at present is Mastersound 2 from the Microdeal/2-Bit Systems stable. £39.95 buys you everything needed to get started, including the sampling cartridge, software, a cable with 3.5mm jack plugs, and a 36 page instruction manual.

The manual isn't too forthcoming about the hardware specification, but the car-

tridge appears to use 8-bit resolution, and under software control can sample at rates up to 30.7KHz. Its fixed filter is set at around 5KHz, which not only reduces aliasing effects, but unfortunately also restricts the frequency bandwidth you can record/replay, even at high sampling rates. It still makes reasonable sounds though, and at the price you can't really grumble!

Connecting up is dead easy. You just slide the cartridge into the ST's cartridge port, plug one end of the supplied cable into the socket on the cartridge and the other into the headphone socket of a suitable sound source, such as an audio cassette player. The headphone output should have a volume control, for setting the signal level going to the cartridge.

The software has two major components, a sample editor and a sample sequencer. The editor actually handles record/replay of samples as well as providing editing facilities. The first step involves setting the correct signal input level, to minimise noise and distortion in the sample. This is achieved by playing the sound you want to sample from cassette and adjusting the headphone volume until the correct level is shown on Mastersound's oscilloscope display. At this point you could also switch on the program's spectrum analyser, which shows an animated barchart type display of the signal's frequency content. Trouble is, the display has no scales to measure anything by, so isn't very useful. It looks good, though!

You can then record the sample, either by manually clicking on the record button or by using auto-trigger, which automatically starts the recording process when the input signal exceeds a selected level. The sample's waveform is then displayed in the main edit window, and you can begin the editing process.

SAMPLE EDITING

The edit window contains two edit cursors displayed as two vertical lines, initially set one at each end of the window. These can be independently dragged to any position in the sample, with accuracy aided by a useful magnify feature, and are the main tool used in editing. They mark the positions in the sample between which you'll be performing an editing operation. These include cut, to remove unwanted parts of the sample; overall sample volume adjustment; fixed treble filtering; fade-in/fade-out; reverse (to play the sample backwards); and compress. The last named allows you to compress the sample into less memory, which also requires a reduced replay frequency (and hence reduced sound quality) to make it replay at the same pitch as before. You can also copy sections of the sample and overlay a sample (or part thereof) on top of another to superimpose sounds and create echo effects.

One rather flash feature the program has is a 3D Fast Fourier Transform display. This decomposes the sample into its constituent frequency bands and then plots each of them against time to produce a spectacular looking "rolling mountain style" three dimensional graph display. Again it has no scales shown, so doesn't have much practical use.

You can replay a sample via the TV/monitor speaker during editing, so you can quickly hear the effect of your actions. STE users can select STE output mode, which uses the machine's DMA output capability, and also gives access to onscreen bass, treble, and volume controls. Output is also routed via the STE's rear audio output sockets, allowing easy connection to an external amplifier. However, you DON'T get stereo sound, as you've only made a mono sample - both sockets carry the same mono signal. Overall sample sound quality isn't exactly in the hi-fi class, but with care reasonable results can be obtained.

Samples can be saved to disk as 8-bit signed data in either raw or AVR formats. The former is just a straight dump of the numeric data, but the AVR format includes a 128 byte header record containing details about the sample's name, resolution, data format, whether mono/stereo, etc. - useful when importing samples into other sample based software using the AVR format. Samples can also be loaded from disk into the editor. Each one loads into the space between the current cursor positions, so by repositioning them after each load it's possible to bring several different samples into memory then combine them in any way you want using the edit facilities. You can create some extraordinary composite sounds this way!

The editor also has a MIDI play option. This allows you to play your newly constructed sample over a two octave pitch range from a MIDI keyboard connected to the ST's MIDI IN port. You can only play one note at a time though - it's NOT polyphonic.

By invoking Mastersound's sequencing function you can record your own complete musical pieces. Up to 18 different samples can be loaded into memory simultaneously, and these can be triggered over a two octave pitch range from the sequencer. It's rather limited as it uses only one monophonic track, but an "overdub" function allows you to build it up in several passes using different samples. So, although you can freely switch between the 18 sounds, you're limited to just ONE sound playing at any given instant. It only records in real-time, and input is from the ST's keyboard - no MIDI option here. There's no visual indication of the notes you've recorded, and no way of editing them other than playing them in again!

The sequencer is the weakest part of the package, so you really need a decent soundtracker program, such as NoiseTracker (Page 6 PD Library, £2.95) as described in the last issue, or Mastersound's companion product called Quartet (Microdeal, £49.95). Both can use sample files produced by Mastersound 2.

Incidentally, I must mention a snag with NoiseTracker I discovered too late to include last time. It's written for a French style AZERTY keyboard, so certain keys on the ST keyboard don't produce what you'd expect! As the program's mainly mouse driven it's no great sweat, but you may have to hunt around a bit to find the right keys, for instance when entering new filenames.

ST STEREO

I'll finish off this column with some good news for non-STE users! Any ST can now use stereo sound, simply by plugging in Microdeal's new Stereo Playback cartridge! This gives it two audio output sockets, just like the STE's. Connect them to your hi-fi using a twin phono plug equipped cable, press PF4, and enjoy Quartet V1.5 sounds in stereo! The package also includes a great new stereo version of AVR's Drumbeat program, which turns your ST into a programmable, sampling drum machine. Also there's a neat "demo-maker" utility, allowing you to create your own demo's which play Quartet music in stereo while displaying any Neochrome picture, your own scrolling message, and four oscilloscopes indicating the sound on Quartet's four tracks. It's excellent value for £29.95.

Note that you don't automatically get stereo playback - neither from this cartridge nor on the STE. Programs have to be coded specifically to use it, otherwise all you hear is the same mono sound through two channels. The Playback package includes suitable BASIC, STOS, and Assembler code examples, so any programmer can ensure his new programs exploit the stereo feature.

That's all for now, folks. Next time I'll take a look at Quartet Stereo and then go on to look at ways of producing higher quality samples, using Microdeal's Replay 8 and Replay Professional sampling packages. See you then.





John S Davison's regular guide takes a look at a new PSS sound editor

Page 6's PD Library recently acquired another excellent ST program for use with Yamaha's PSS series of MIDI keyboards. PatchEd and PSSED (described in issues 42 and 43) have now been joined by PSS SoundShifter, written by Henk Hensing of Amsterdam. Like the other programs it's primarily a voice patch editor designed for quickly creating new sounds, but it does have other useful functions too.

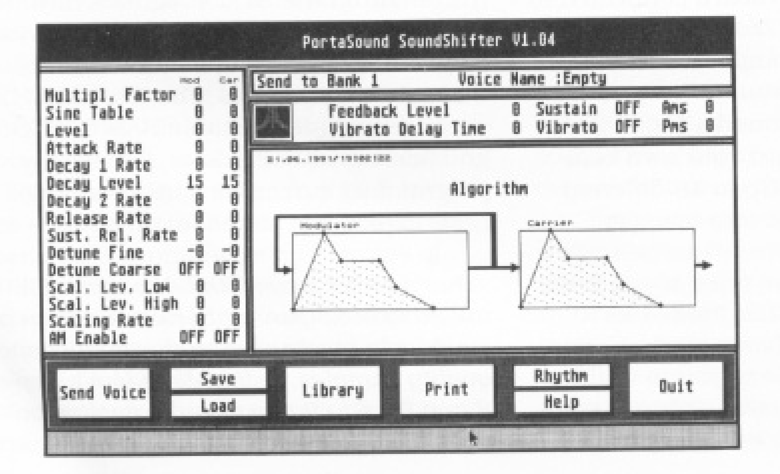
SoundShifter is written specifically for the Yamaha PSS-480, 580, 680, and 780 models. Please note it does NOT support the current PSS-590 and PSS-790 models, as these employ a totally different method of sound synthesis which requires different editing software. At the time of writing I've not seen anything that can handle them - please write and tell me if you know otherwise! SoundShifter runs on any ST/STE and works in colour or hi-res mono, and I must say it looks particularly good on a mono monitor. It actually does three jobs - in addition to voice patch editing it's also a patch librarian and drum rhythm editor. Let's have a quick look at each function in turn.

The patch editor screen allows you to edit all 36 of the PSS's voice parameters, rather than just the 9 available from the PSS's front panel. This gives you full control over the sonic capabilities of the PSS's two-operator FM synthesis system. Changing parameter values is as easy as clicking the mouse on them. To hear the effect of the changes the new voice patch can be quickly downloaded to any of the PSS's five voice banks and auditioned without you touching the PSS's keyboard. One mouse click initiates the download and plays a chord using the new patch!

The edit screen also graphically displays the shapes of the PSS's ADSR (Attack Decay Sustain Release) envelopes based on the current parameter values, to help you "visualise" the sound you've created. You can also print out a neatly formatted list of the current voice parameter values, if you need hardcopy for reference purposes.

PATCH LIBRARIAN

Voice patches may be individually saved and loaded to/from disk, but you're more likely to want to use SoundShifter's patch librarian function. This saves/loads sets of up to 25



voice patches as one library file on disk, giving virtually unlimited patch storage capacity, organised however you wish. For instance, you could set up separate libraries to hold different types of sounds, keeping all piano sounds together, all basses together, and so on. You can also build smaller sets of five patches known as configuration files, which again can be saved/loaded separately. They can also be directly downloaded to the PSS's five voice banks with a single mouse click. SoundShifter comes complete with several libraries, but these contain mainly the PSS's preset sounds, useful as starting points when creating your own sounds. There are a few new sounds, but they're not very inspired. The author obviously intends you to create your own, and he's even made this as easy as possible by providing the "Magic Library Utility" function.

This function automatically generates a set of 25 random variations on any chosen voice, using any of four different algorithms. It's very fast, taking only about three seconds to generate each set! You can then quickly audition each patch, tweak them further with the editor if necessary, and save those you like. This is a great feature, and tremendous fun to use!

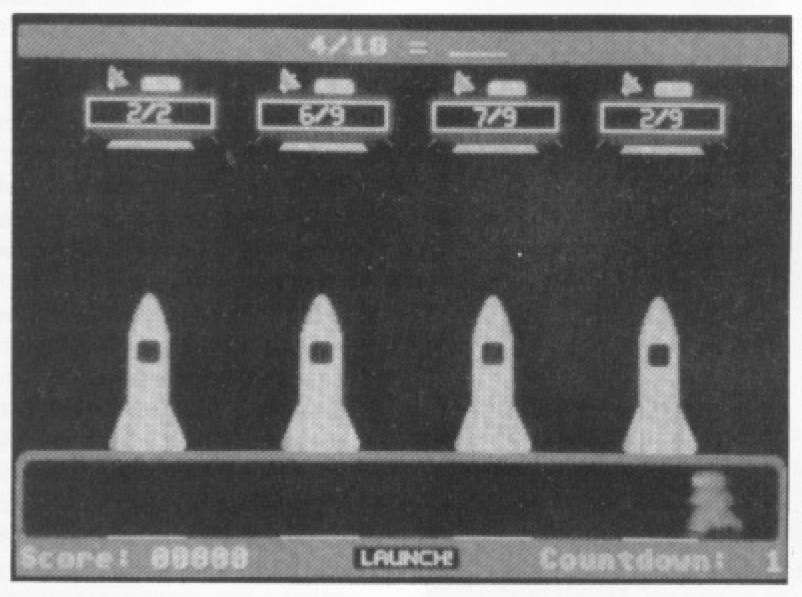
RHYTHM EDITOR

Finally, there's the rhythm editor. This allows you to quickly build rhythm patterns for the PSS 680/780's Custom Drummer feature, using the traditional grid-based approach for visual editing. You can define a kit of up to 16 drums from the PSS's set of 32, then graphically build up a rhythm pattern to play this kit by clicking on appropriate positions in the grid. Patterns up to eight beats long are handled, with each beat split into eight subdivisions, giving a total of 64 possible trigger positions for each instrument in the kit. This isn't much compared with standard drum machines, but it's all the PSS machines can handle in one go! It doesn't work in real-time either, you have to download the pattern to the PSS before you can hear it, but this only takes a moment. Kits and patterns can be saved to disk, and details printed out as a neat diagram for hardcopy reference.

SoundShifter is quite intuitive and easy to use, which is just as well as the documentation supplied on disk is written in Dutch! Operation is rather mouse intensive though, especially when auditioning patches generated by the Magic Library Utility. I found myself wishing there were keyboard shortcuts available. Unlike PatchEd and PSSED, SoundShifter can't upload anything from the PSS, but then there's no real need to as it already has the complete set of PSS preset voices in its libraries.

Overall, I think SoundShifter is a top quality program and can strongly recommend it. Even if you already own PatchEd and/or PSSED you'll probably want SoundShifter for the convenience of its rhythm editor and Magic Library Utility. At just £2.95 it's a bargain not to be missed!

MATH BLASTER



Davidson and Associates are a major producer of educational software in the USA, mainly for IBM and Apple computers. They've only ported one of their packages to the ST, and this is it! Math Blaster Plus (MBP) is aimed at 6-12 year old children and is designed to help them practice basic maths problems, using addition, subtraction, multiplication, division, fractions, decimals, and percentages. It does this via five different activities, between them providing over 750 problems at six stages of difficulty for the child to complete.

The activities are called Countdown, Ignition, Liftoff, Orbit, and Blasternaut. As you've probably guessed they all have a space travel theme, although this isn't overdone as only Blasternaut could be considered a "game". Each builds on what's taught in the previous one, but they can be tackled in any order, if required.

Countdown provides practice with basic facts that should be remembered. A problem is presented complete with its correct answer, which the child has to memorise. The answer is then removed and the child has to key it in from memory. A nice touch is that the problems can be presented in horizontal (e.g. as in 5+6=11) or vertical format (figures written in columns) to suit the preferred method of working. Ignition takes the idea a step further, presenting the problems without showing the answer first. Liftoff extends this to the point where any part of the problem may be missing, e.g. 12+??=23, so the child may have to work back from the answer to supply the missing part. Orbit presents three problems at once, complete with answers which may be right or wrong. Each has a part of the problem highlighted, and the child has to decide whether or not this part needs correcting to produce the right answer.

Blasternaut is a game using the skills learned in the other activities. A problem is displayed at the top of the screen, and below it are four spacestations, each marked with a different answer. The child has to manoeuvre an astronaut into a rocket aimed at the spacestation with the correct answer. Three levels of difficulty affect the time allowed to get the rocket to the correct spacestation. "Bonus rounds" are used to maintain interest, where the astronaut has to be manoeuvred into the correct rocket to intercept a spaceman or satellite floating across the screen.

ANIMATED REWARDS

Correct answers are rewarded by congratulatory messages and cute little animated characters cavorting across the screen. Generally, two wrong answers to a problem are allowed, after which the program displays the correct answer then continues with the next problem. At the end of a stage, the child is asked whether he'd like to retake the problems answered incorrectly, or to carry on.

Progress records may be kept, requiring each child to "log on" to the program before beginning a session by keying in his name and today's date. Then, as he completes each stage, the program writes a record to disk noting stage and score details, which can later be reviewed and printed as required. A really nice touch is that if a child scores 100% on any topic a smart certificate proclaiming the fact can be printed, using an Epson compatible printer's graphics capabilities. This worked perfectly on my Star SG-10.

MBP was originally geared to the American education system, but the concepts it presents have to be learned by all children at some time, so this is of no real concern. Also, the package includes a problem editor so you can modify the problems presented - either to make them fit a particular curriculum, or to generally extend the scope of the package. This feature can also be used for the preparation and printing of test papers.

USER FRIENDLY

The program is very easy to use, both for the teacher/parent and for the child. The supervisory functions are generally accessed via mouse selection from menus, while the child's input is usually from the keyboard. Virtually everything displayed is accompanied by an onscreen prompt of some kind, so it's always fairly obvious what you have to do next. Even so, there's an excellent instruction manual provided which explains everything clearly and concisely. The whole thing is a model of user friendliness - I was very impressed.

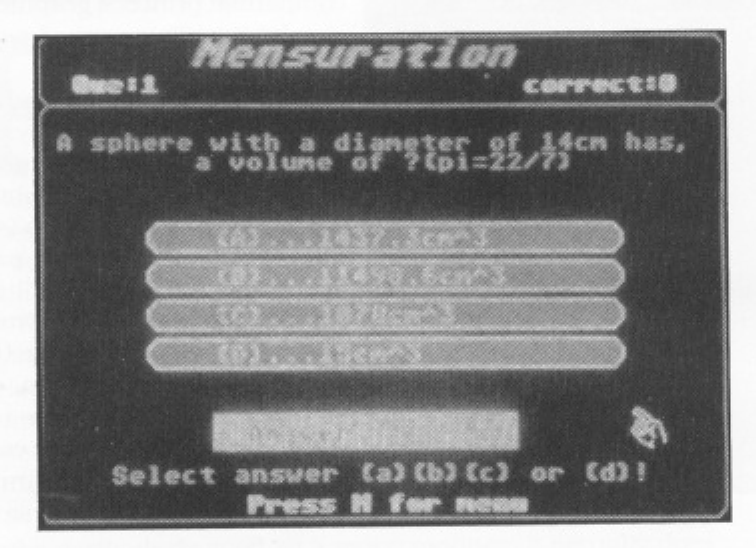
The problems are displayed in big, bold characters, so it's possible to use the program with groups of children simultaneously if required. The animated graphics are neat and colourful, but could do with a little more variety. Sound could have been used more imaginatively too, but these are very minor criticisms.

The simple appearance of this program belies the thought and care that has obviously gone into its design and implementation. The result is a very fine piece of educational software. Its quality shows - in its ease of use; progress tracking capability; extendability; and its psychological aspects such as the little rewards, bonus rounds, and certificate printing. Its design makes it perfect for use in schools, but it's great for home use too. If you take educational software seriously, make sure you consider Math Blaster Plus. It's expensive, but worth it!

Title:	**MATH BLASTER PLUS**
Publisher:	**ABLAC/Davidson**
Price:	**£34.95**
Reviewer:	**John S Davison**

EDUCATION

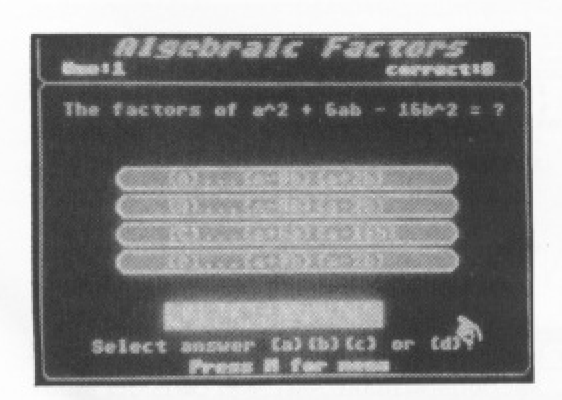
BETTER MATHS



School Software are fast becoming a major supplier of educational software for the home market and have recently been busy porting some of their products to the ST. Better Maths is their latest offering, and is a package of maths programs covering a comprehensive range of topics of interest to GCSE and similar level students in the 12 to 16 year old age group.

The package consists of one single sided disk tucked into a plastic wallet with just a School Software catalogue for company. There's no instruction manual, but I found it wasn't really necessary as the program is fairly intuitive in use.

Better Maths can be used in two ways, the first being for tuition in certain mathematical topics and the second as a source of exercises and tests - useful for revision purposes. The tuition section covers algebra; ratios and gradients; factors; quadratic equations; plus a "general revision" section. To check the student's understanding of the tuition, the program asks lots of questions. They're answered by "filling in the blanks" left in various statements, from a list of answers at the bottom of the screen. The program only gives a basic outline of the topics, so the student would be wise to use it in conjunction with a standard maths text book. He'll need one anyway, as the tuition only covers a few of the topics included in the other parts of the package.



WIDE RANGING TOPICS

The rest of the package is divided into two major chunks, called Better Maths 1 and Better Maths 2. The first part covers mensuration (areas of squares, rectangles, circles; and volumes of cylinders and spheres); statistics (bar charts, pie charts, mean, mode); simple interest; factors (prime numbers, highest common factor, lowest common multiple); percentages; simple calculations; algebraic expressions; algebraic factors; tables (logarithms, not multiplication); approximations; fractions; sequences and series; geometry; means and multiples; sets; and trigonometry. Phew, that's quite a list! The menu for the second part is rather unspecific though, with items blandly listed as Test 1, 2, and 3; Arithmetic 1, 2, and 3; and Mathematics 1, 2 and 3.

Both parts follow a similar pattern. For each menu item chosen a series of questions are asked, again with the possible answers chosen from a selection shown on the screen. Two attempts at getting the right answer are allowed, after which the correct answer is displayed if the student still hasn't got it. At the end of each section the program displays simple bar charts showing the number of right answers, wrong answers, and average score over all sections completed so far. There are also a number of separate test sections, each covering a variety of topics rather than being limited to just that of an individual section.

BLITTER DEMO?

I reviewed Better Maths using my new STE, and one thing it unexpectedly demonstrated was the effect of the blitter chip! The title screen contains a horizontally scrolling message, which initially whizzed across the screen at a rate too fast to read. After turning the blitter off and reloading the program the scrolling was much slower. So far it's the only program I've seen where the effect of the blitter has been so obvious.

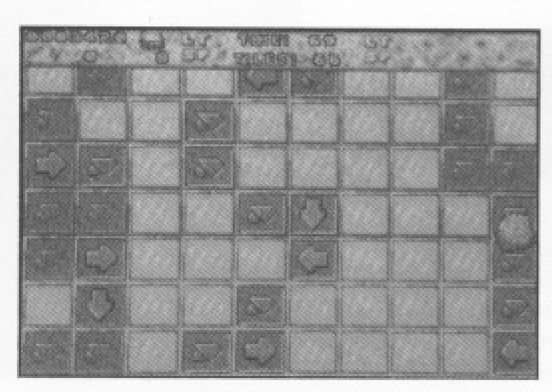
After using the program for a little while I became amazed at just how much of the maths from my (far) distant schooldays I could remember! I guess this must be an indication that it does achieve one of its aims - to act as a revision aid. I liked the interactive nature of the program, but after only a short while it became obvious that the program could have exploited the computer's capabilities far more than it does. For instance, it could have used animated graphics to illustrate some of the more difficult concepts, such as finding the roots of a quadratic equation by plotting the graph of the function. Apparently the IBM PC version DOES include such facilities, but regrettably the ST version doesn't.

Also, although the general content of the program was fine, I thought that some topics appeared in the wrong sections. For example, the trigonometry section included an item that seemed to belong in the mensuration section; and the three "mathematics" sections in part two included items I'd class as arithmetic. But perhaps I'm just being too picky.

Overall, I was a little disappointed by Better Maths and eventually came to the conclusion that it really wasn't doing that much more than a good maths textbook or printed revision aid. Its strength is its interactive nature, and I suppose the fact that you're NOT working from a book can sometimes be beneficial too. A break from pure bookwork can make a welcome change, especially in those long tedious hours of revision before important exams. It won't totally replace a standard maths textbook, but you could find it a useful complement as an alternative study aid. I suggest you try to see it in action before making up your mind about buying.

Title:	**BETTER MATHS**
Publisher:	**School Software**
Price:	**£22.95**
Reviewer:	**John S Davison**

SUPER SKWEEK



Super Skweek is an excellent example of how to breathe new life into an old computer game. Loriciel have taken the old concept of requiring the hero to change the colour of every square on the board by walking over it and added an incredible number of extra features to make a superb new arcade game.

They have taken ideas from dozens of other games and crammed them all into one enormous explosion of sound, colour and movement. The scrolling screens are made up of countless special tiles - there are slippy tiles, exploding tiles, one-way tiles, teleports, raised areas, lifts, shops, shrinking tiles, monster generators, blocks and ones that just need to be painted. There are special ones which paint or unpaint all the ones around them, or flip the colour of every tile on the board - there are 45 different tiles and I still haven't worked out what they all do!.

There are all sorts of monsters as well - fast ones, slow ones, invulnerable ones, flying ones, thieving ones, the list goes on and on. You need to kill these both to survive and to get money.

As well as special items which give you extra points there are dozens of bonuses which appear at random or can be bought in the shops (check all the shops as many of them offer certain items for free!), they include: 4-way, 8-way, circular, zig-zag, laser, homing, and boomerang shots; extra lives, exits to the next level, more time, shields, non-slip shoes, turbos and slow-downs; special painting - everything you shoot gets painted, or all squares adjacent to you get painted, or tiles above you get painted. You can even get a map of the whole level and (fairly unique for an arcade game) you can SAVE your position and reload it as many times as you wish - no more having to restart from the beginning!

There are 225 levels in groups of 45 - you can start at 1, 46 or 91, or you can elect to try the levels in random order ... and, there are levels where the objective is to rescue all the Skweezettes or kill certain monsters ... and there are bonus levels with lots of gold to pick up ... and there is a 2-player version ... and there is a Construction Kit! This one really has got EVERYTHING!

FACTS

Title: **SUPER SKWEEK**
Publisher: **Loriciel (Infogrames)**
Price: **£19.99**
Reviewer: **John Sweeney**

SIGHT & SOUND

A pandemonium of sound and colour - excellent!

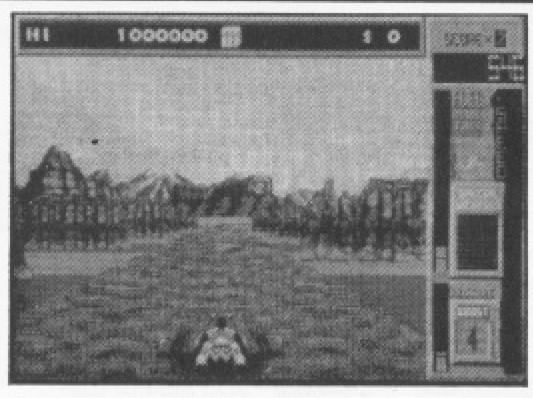
GAMEPLAY

Joystick-driven, kill all the baddies while you charge madly round the board!

VERDICT

Great fun, very addictive, super value for money

HYDRA



FACTS

Title: **HYDRA**
Publisher: **Domark/Tengen**
Price: **£24.99**
Reviewer: **Damon Howarth**

SIGHT & SOUND

Everything that you would expect from Tengen, both are strong

GAMEPLAY

Responsive controls and fast action make this a good conversion

VERDICT

Not particularly enthralling, no real uniqueness

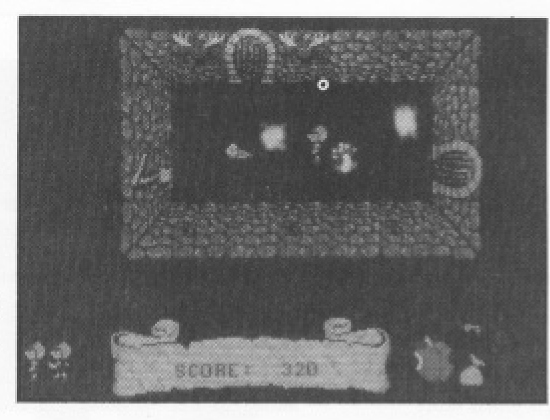
This is another in the long line of arcade machine conversions from Domark. It is based on the machine of the same name and the expectations of the game are for the player to guide a speedboat on a variety of missions carrying certain dangerous viruses or doomsday devices and even objects of great value such as the crown jewels, but never once a fish supper! This game has a healthier view of the 21st Century since the scrolling riverway is still blue and there are still trees despite the actions of madmen in boats blowing them up. The eponymous Hydra is in fact the player since that is the code name you have been offered by the firm.

You propel yourself and your valuable cargo in the Hydracraft trying to destroy or dodge the myriads of opposing forces that wish to stop the mail. Surprisingly should you succeed in destroying enemy craft they are so elated that they release a shower of cash carrying balloons which you need to vandalise to obtain your wages. This money is later spent on bettering your boat to enable you to create more mayhem and destruction.

Graphically the game is well up to the Tengen standard and shows all the love and care lavished on the big machine. Sonically it is very strong with pounding beats and loud effects. As with so many of these conversions the technical work is solid and offers good playability but the context is not novel enough to make me wish to spend large amounts of money on it. Perhaps when standing in the flashy case in the arcade with loud music and a steering wheel these games have a curiosity value and may well see the player feed them the odd pound or so in the arcade but at home the excitement is missing. The game is a good conversion but sadly left me wondering why I ever wanted to deliver the missions and offered me no feeling of addictive quality.

The game is playable but I could not whole heartedly recommend it as a must or even a probable buy. If you like boat pursuit games or that particular arcade machine then try it otherwise it is only a worthy also ran.

CREEPY



Here we have a piece of budget software from a firm that has produced some highly enjoyable games. In this particular piece of silicon whimsy it is the player's role to reclaim the light of the land which is being stolen by the Dark Lord. This somewhat anonymous person surprisingly lives in a castle and as the least experienced and most innocent person in the community it is your job to stop him. Sometimes I wonder if innocent actually translates as foolish or gullible.

The castle is represented by overhead 3D graphics with myriads of little monsters appearing from nowhere to suck life out of you as the hero tries to both avoid them and collect the money that keeps appearing in front of him. It seems to be a good thing to capture dragons belonging to the amazon types. These creatures allow the hero to ride around in some state of invulnerability, at least until the dragon dies!!

The object is to find keys and chests to access other parts of the castle and eventually save the world. The controls are very simple needing no more than a joystick and a space bar to activate magic potions that appear along the way. Oh yes! the money is used in Hugo's various branches of magic shops which allow the purchase of useful things which either allow extra life points or special effects to take place. Detailing too much of the potions would take a great deal from the game since much of the fun is found in determining their functions.

The game reminds me of the old game Attic Attack that proved a great favourite on the Spectrum. The graphics are very well drawn and offer the same sense of fun as the rather tongue in cheek presentation of the game. I found that the lack of combat power surrounding the hero made him a target for all the energy sucking creatures although the possibilities of mounting dragons for security make the chances slightly better. Even though I was kindly supplied with a cheat sheet the task was not easy and had I not been appraised of the correct sequence of events I would still be wandering round lost. The game offers a lot of space for prolonged play although it may become frustrating due to deaths.

FACTS

Title:	**CREEPY**
Publisher:	**Atlantis**
Price:	**£6.99**
Reviewer:	**Damon Howarth**

SIGHT & SOUND

Very 8-bittish in performance although the 3D effect is both nostalgic and good for this type of game, FX adequate

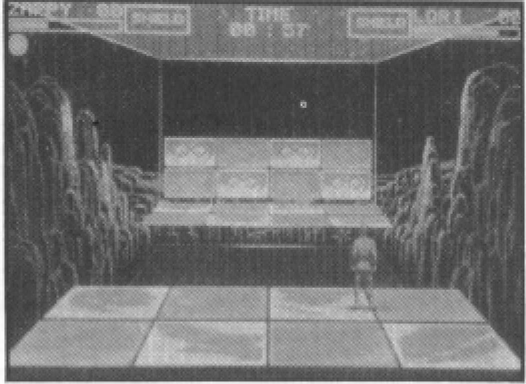
GAMEPLAY

Good, smooth sprites and fast enough for me

VERDICT

Extremely enjoyable little romp, good value for a budget game

DISC



FACTS

Title:	**DISC**
Publisher:	**Loriciel (Infogrames)**
Price:	**£25.99**
Reviewer:	**John Sweeney**

SIGHT & SOUND

Great high-speed animation, lots of good sound effects-

GAMEPLAY

VERY fast joystick-drive, violent sports game

VERDICT

A nice idea, well implemented - starts easy and gets ridiculously hard!

Anyone for tennis?

While not quite tennis, actually. The net has been replaced by a gaping abyss, the ball by lethal frisbees, and the ground under your feet disappears tile by tile as your opponent smashes the corresponding tiles on the wall behind you!

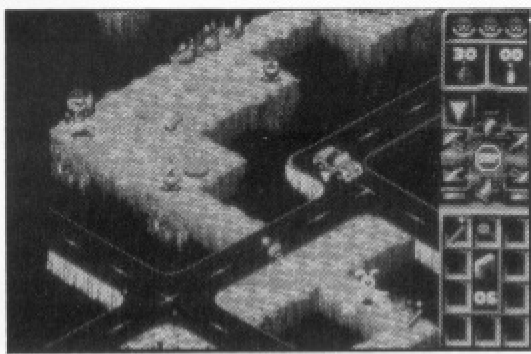
This violent futuristic sport is completely joystick-driven. There can be a number of discs in play at any one time. Provided you are standing in the right place and you were the last person to touch them or parry them well then you will automatically catch incoming discs. The rest is up to you, you can throw high or low (by long or short button pressing), and you can use the joystick to control the direction of your throws and parries and also to move around the playing area. Fortunately your character will automatically somersault over gaps between tiles. There is a training mode which helps you learn how to hit stationary and moving targets, and how to parry and dodge. Then you get into the real game - you have to beat more than a dozen computer opponents of varying quality in order to make your way up the ranks from Novice through to Great Guide. Your character's rank is automatically saved to diskette.

You can challenge anyone you wish, enter a knockout tournament, or go for the Championship - playing all the other players in order of superiority. Just to make life even harder there are various special discs - power discs, speed discs, homing discs, shields, etc. which you acquire randomly by hitting a roving question mark.

Disc takes a little getting used to the controls, but then it is a very fine little arcade game. It is beautifully animated - the players get pushed back by each blow from a disc, wave their arms wildly if they lose their balance and leap all over the place parrying discs.

You can also play against a friend in a two-player version. You take it in turns to play in the foreground - whoever is there has the advantage that they can see their enemies backboard which indicates how many blows each tile will take before disappearing together with part of the ground!

BRAT



Nathan the baby truly is a brat, and Fred the babysitter has got his work well and truly cut out when he looks after the little guy on one particular night. Nathan's parents have gone out for the evening and the little devil decides to discard his nappy and don his tight fitting leathers and cool shades as he searches for a method to annoy the poor defenceless Frederick. Unfortunately, due to some strange twist of fate the little Brat is sucked into the toy dimension and is now up to his neck in trouble. Oh no!

Fred realizes this immense problem and manages to teleport to the toy dimensionand has to guide the little guy through the twisting passages of the unusual world. Being unsure of his footing Nathan needs considerable guidance, so Fred is going to have to lay down arrows on the ground which will show him where to go.

The basic style of Brat is a scrolling platform game which is just that little bit different. The isometric view depicts young Nathan as he walks along the narrow passageways of the toy dimension. The young chap doesn't ever stop, so it is up to you, as Fred to lay down guidance arrows to steer our hero out of trouble. Along the way, all kinds of bonus objects can be found so you can collect a plethora of extra points.

Graphically the game is really very good. The cartoon style, colourful graphics coupled with the silky smooth scrolling gives the game a very slick appearance which will appeal to both young and old players. Likewise the sound is of a superior quality and there are some really nice little sound effects dotted throughout the game.

Where Brat scores most highly is when considering its playability. It really is very addictive indeed and the numerous little puzzles will keep you occupied for hours. There's a nice password system for each level so there's absolutely no excuse for giving up if you can't finish that last level!

The game is filled with humour and there is a really great introduction sequence with some fantastic sampled sounds. If your in the market for a puzzle/platform game you could do far worse than th-

FACTS

Title: **BRAT**
Publisher: **Mirrorsoft**
Price: **£24.99**
Reviewer: **John Davison jnr**

SIGHT & SOUND

The colourful graphics and smooth scrolling are all of the very highest standard. The flash introduction sequence is simply a taster of what is to come

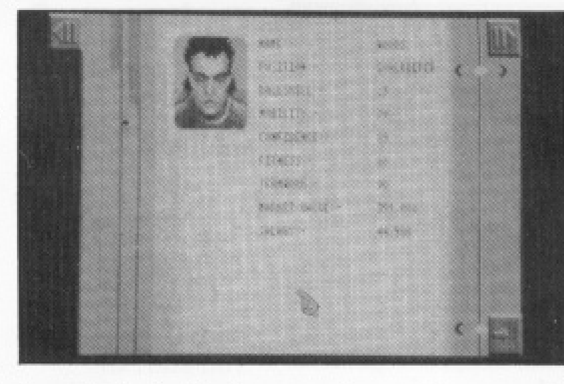
GAMEPLAY

A fun little game which actually makes you think and a good laugh which will keep you absolutely addicted for hours

VERDICT

A superb game which should be a part of any puzzle/platform fan's collection, highlyly recommended

EUROPEAN SUPERLEAGUE



FACTS

Title: **EUROPEAN SUPERLEAGUE**
Publisher: **CDS Software**
Price: **£24.99**
Reviewer: **Damon Howarth**

SIGHT & SOUND

Graphically intense with little sound of note. Pity about the game graphics though

GAMEPLAY

As a management game, fine, as a football strategy game perhaps lacking a little

VERDICT

Could be okay for enthusiasts, try it and see

The football season begins in August amid much thought of a super British league but this game takes the theory one step further and introduces us to an all Europe league.

The presentation is strong with a sensibly sized box, lucid bilingual instructions and two disks. Even the screenshots are fair representations of the fare inside. In play the game allows you to change the names of any team thus it is possible to arrange for Colne Dynamos or Stafford Rangers to win over Ajax or Liverpool. The game is a strategic one rather than another joystick thump and as such presents as a more complex version of Football Manager. You are responsible for training schedules, transfers, squad selection and tactical formations. You are also responsible for the report to the board and can be fired very swiftly.

Control is by the office furniture, for example click on the filing cabinet and receive information on squad, money, opposition etc., on the phone or intercom to contact various agencies or even the whisky bottle to pass the time! The game appears to be as much a simulation of office management as winning football games! To add to the pressures of the game the telephone and intercom keep you busy normally while you want to make other reports or reviews, thus the game insists on a phenomenal amount of disk access.

Game day receives a somewhat lackadaisical approach with a few (skippable) stills of the highlights, an option to change players or tactics at the half, and no information as to scorers or foulers or performance of individuals. Indeed the games which you spend so long preparing for seem to be an afterthought and an anti-climax. There is even a small bug which refuses to acknowledge postponed games replayed on Wednesdays as results, I managed to play several weeks with a missing league game which we won not being accepted. Thus our league position was low and the management fired me.

The game has potential but falls down on its final production, a little disappointing.

ENCOUNTER ST



Encounter met with worldwide acclaim about four or five years ago. Not only was it a highly popular 8-bit release but it marked the arrival of a true personality in the software scene - Paul Woakes. This man went on to create such classics as Mercenary and Damocles. Now, after all this time, the ST is finally graced with the old classic Battlezone style game. This sixteen bit rework of the original has changed very little, obviously the graphics have been changed somewhat, but the overall look and feel of the original has been retained.

You are the pilot of a suped-up speed tank which flits about the surface of an obelisk filled world. Your mission is to blow the living daylights out of a number of hostile vessels which are infiltrating the zone through inter-dimensional portals.

Unfortunately these little vessels possess an awesome firepower, and have the ability to zoom around the landscape at breakneck speed. They have a very nasty habit of hiding behind one of the many obelisks scattered across the plain and then slinging hundreds of laser bolts in your general direction. Friendly eh? All you have to do is shoot back and hope for the best. All laser shots within the game have a tendency to ricochet off any objects which get in the way. This is really great once you've got the hang of it, you can gain real satisfaction from getting a meanie by bouncing your shot off multiple obelisks.

The only major difference between this and the original 8-bit version is the between level section where you must negotiate your way through a 'neutral zone' which lies beyond a dimension gate. On the old version this was filled with obelisks, however, the ST gives you tumbling asteroids and meteorites which fly towards you at tremendous speed.

Graphically, this is a really good demonstration of how an ST can really scroll. All of the movement is both very fast and exceptionally smooth and slick. The background graphics are a bit simplistic but they are more than effective - they're certainly better than the original battlezone screens! Sonically it's a bit basic, quite adequate.

FACTS

Title: **ENCOUNTER ST**
Publisher: **Novagen**
Price: **£20.42**
Reviewer: **John Davison Jnr**

SIGHT & SOUND

Silky smooth and very fast showing that the ST is more than capable of smooth scrolling. Sonically it's nothing special but more than adequate

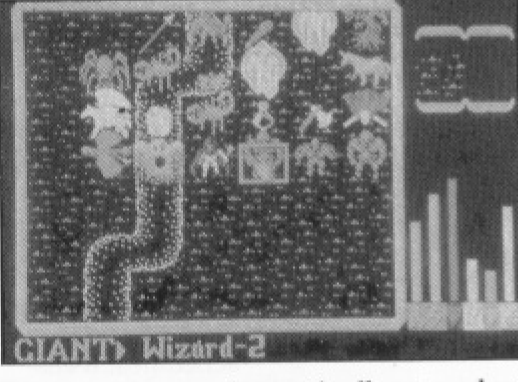
GAMEPLAY

I loved the original, so I was going to enjoy this no matter what. If you like a good mindless blast you will love it

VERDICT

Fans of the original will love it but the younger, more sophisticated games player will soon tire of the gameplay as it is a touch on the repetitive side

LORDS OF CHAOS



FACTS

Title: **LORDS OF CHAOS**
Publisher: **Blade Software**
Price: **£24.99**
Reviewer: **John Sweeney**

SIGHT & SOUND

Lots of fine, colourful graphics, nice sound effects-

GAMEPLAY

Good WIMP once you get used to it. Care must be taken not to waste Action Points. Manuals are a bit obscure!-

VERDICT

Nice to see a different approach to computerised D&D - well worth a go, especially the multi-player version-

Fantasy warfare with all the standard stuff: a bird's eye view of the terrain, lots of icons for selecting your actions, and lots of monsters, weapons, spells, and treasures scattered across a variety of landscapes. But there are a couple of things which make Lords of Chaos a bit special.

First, 27 of the 47 spells are for summoning creatures to fight for you: Demons, Giant Spiders, Unicorns, Trolls, Dragons and many others, each with their own special characteristics. So you can build up a large army of creatures to fight for you. On each turn you can move each of your creatures up to the limit of its Action Points to explore, fight, or anything else which is allowed.

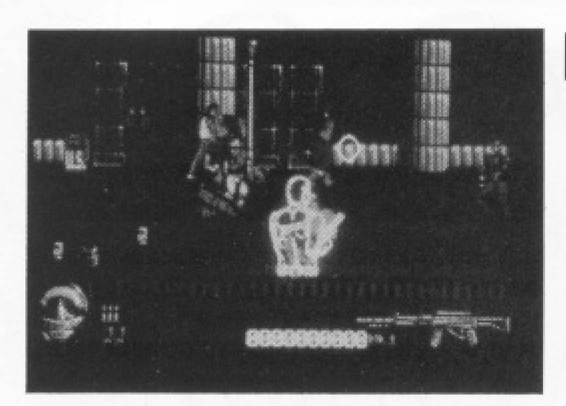
You start the game by designing a wizard - spending experience points on making yourself stronger, healthier, etc. and on learning spells - this determines how many helpers you will be able to summon. Then you enter Scenario 1 which is a wilderness with a few houses for the wizards. Your objective is to gain experience by killing and treasure gathering, then survive long enough to escape through a mystic portal. If you succeed you can spend your new experience points on improving your wizard's personal characteristics or on learning new spells.

There are two other scenarios provided with the basic game - a dungeon and a castle - each full of traps, secret doors, and hidden treasures.

The other special thing about Lords of Chaos is that it can be multi-player. Up to 4 players can be controlling rival wizards. You take turns at moving your wizard and his creatures, so you need something else for the others to do while waiting for their turn! The game is carefully designed so that each player can only see enemy characters if they are in direct line of sight. This allows for some very sneaky manoeuvres!

The controls take a little getting used to as the mouse buttons do different things at different times, so you will find a few problems to start with like walking into closed doors, but once you get used to it it is quite a good system and allows you complete flexibility in controlling your actions.

PREDATOR 2



A film licence game often brings on the fear that the game will not live up to the film, they seldom do. With a licence on a sequel the fears are worse for the film sequel seldom lives up to the original so I did not have great expectations when I booted this up. My initial reaction however was pleasure, the opening screen and music were extremely effective and both complemented each other, and the software is bright enough to recognise the second drive, no "please insert disk two" message. My jangled reviewing nerves calmed a little, on the first game screen the graphics were very good, a full horizontal scroll across the screen with plenty of colourful smooth movement and a cornucopia of action. The player taking the heroic role of Mike Harrigan sees himself as a see-through white line drawing using whatever weapon comes to hand.

The playing style is that of target shooting carefully choosing targets and bonuses and not shooting helpless innocents and colleagues. The action manages to follow the film's plot very well with the Predator making more noticeable appearances as the levels go on. This trick actually manages to create a little dramatic tension and makes a marvellous "hook" for the story to hang upon. Apart from the locale there is little variance in game play through the levels but that seems to pale when the speed and skill factors are accounted for. The game has a mouse option which I somewhat unwisely opted for. Although aiming is far more precise the speed at which fingers need to tap buttons is wearing on tendons and leads to mouse users cramp.

It is possible to upgrade weapons by shooting them as they appear on screen as does the ammunition and body armour to keep you alive. There is also a police shield which corrodes slightly for every innocent you kill - kill too many and you are booted off the force.

This game has the action required of a film that is basically shooting and violence and is an extension of the Untouchables game that appeared last year. As a shooting gallery game it is great, as a licence it works and as soon as my finger tendons have relaxed I'm going back in there.

FACTS

Title: **PREDATOR 2**
Publisher: **Image Works**
Price: **£25.99**
Reviewer: **Damon Howarth**

SIGHT & SOUND

Both excellent, soundtrack and FX apt and atmospheric, Piccies colourful and stylish

GAMEPLAY

Very fast - don't use the mouse unless you have spare fingers and mice!

VERDICT

Excellent I like target games and this is one of the best

THE KILLING CLOUD

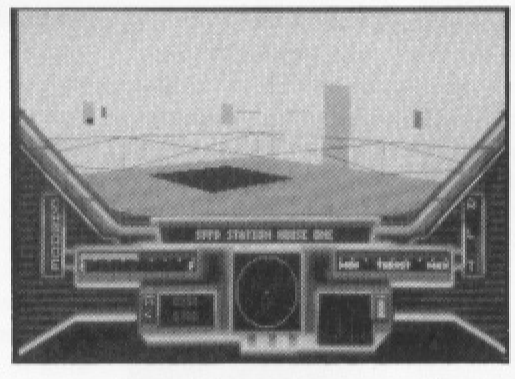


Image Works have, since their original association with the Bitmap Brothers, produced interesting science fiction scenarios. This is no different a good plot that may have sprung from a Schwarzenegger movie, not quite so much a shoot 'em up, more the definitive guide to policing in the late 1990s. The heart of the game is a form of flight simulation based on a jet cycle, and should this prove an accurate prediction of the future I would like to place my name on a waiting list for a vehicle!

The action takes place in San Francisco which has succumbed to the pollution problem and is now covered in a Bio-- Cloud of poisonous fumes. This does not stop the local mob employing new technology to hijack and rob the good citizens, thus it is your job to clear 'Frisco of the slime. The game is multi staged with each level being preceded by a briefing from a sergeant (I was most disappointed he did not tell me to "be careful out there!") that initiates the strategic element of the game, the selection of weapons and resources to be used around the beat for the day. These items included personal armour and armaments for the bike such as machine guns, rockets, cannon and so on together with the tactical placement of capture nets and the modern Black Maria called a pup.

Should captures be made it is possible to interview your prisoners to obtain information from them. This is done via a set menu of questions which receive varying degrees of compliability.

Graphically the game is strong with some very effective 3D blocks being used, the mugshots of the enemy also provide a degree of authenticity and allow the chance of finding the man you want to talk to. I enjoyed the fact there was so much of a tactical nature to the game and that it was possibly less intensive on pure blow them out of the sky tactics rather than the option to lure foes into traps. As a combat flight simulator it is not too bad although I am not convinced that it rivals F15 and such purpose built offerings. I enjoyed the game as a challenge although I did not find it altogether relaxing!

FACTS

Title: **THE KILLING CLOUD**
Publisher: **Image Works**
Price: **£25.53**
Reviewer: **Damon Howarth**

SIGHT & SOUND

Bright and noisy, good scrolling and fine pictures, the FX and suitable and loading music are acceptable

GAMEPLAY

On the whole acceptable perhaps hard to pick up at first with the keyboard options being so vast

VERDICT

Entertaining and not as run of the mill as many. Try it first

Peter Hickman's

STOS COLUMN

A great arcade classic type-in

Hello, STOS freaks and welcome to another exciting mixture of news, programs, more news and even more news!! Actually I was thinking that this issue was gonna be full of doom and gloom, STOS 3D still has not arrived although Mandarin assure me it is so close to release you can smell it! Maybe a review next time (haven't I been saying that for over a year?).

Fortunately gloom and doom are not prevalent on this glorious June day 'cos a nice letter (together with a press release) has just popped through my door. The letter is from Fraser Newham (the guy won the little compo which we ran a while back!) who together with fellow students from HUTCHESONS GRAMMAR SCHOOL (Natalie Hamilton, Wendy Bishop, Joel Conn, Graham Watt, Gail Kent and Kira Smylie) has won a mega award. The competition was the EUROPEAN SCHOOLS INFOMATICS AWARD and the team came up with a fabo system for controlling water, ventilation and lighting in the home via a BBC machine (ok, so nobody is perfect!). Where does the ST come into this? Well, to make the system truly flexible Fraser wrote a speech recognition program using STOS and the STOS MAESTRO cartridge which he won in the STOS competition, amazing huh? Anyway Fraser has written to me asking if I know of a way to control a current via STOS and the ST, well I must admit to being pretty techno-ignorant (as the old joke goes - How many computer programmers does it take to change a lightbulb? The answers is none! It's a hardware problem!!!!!) so if anybody out there who can help integrate the whole system around a single ST rather than using a myriad of different machines for different tasks drop me a line and I will pass on your letter to Fraser and the team (oh and by the way they have been asked to defend their title next year in Copenhagen! Good luck!).



Award winning pupils from Hutcheson's Grammer School. One of these folks is our STOS competition winner Fraser Newham, but which one is Peter Hickman?

Okay, another bit of good news is that ex-Mandarin employee Nick Harper seems to have found a publisher for his STOS game OZONE. Those nice people at Electronic Zoo are very interested and are currently talking to Nick about a late summer release! Just as a point of interest Electronic Zoo also published Xiphos which was written by the same team who are doing STOS/AMOS 3D!!

Over the past few months I have been in contact with a very nice chap named Dion Guy. Now poor old Dion has been sending me regular issues of what was a new newsletter/magazine devoted entirely to STOS, unfortunately they always arrived just after I had finished writing this column and by the time the next one came round I had forgotten all about it (sorry Dion!). This time I have remembered!!! This newsletter type affair (entitled - THE STOS MAGAZINE) comes on six photocopied (and double sided) stapled A4 sheets together with a disk full of programs. The paper part of the magazine is mainly concerned with providing breakdowns of the disk-based programs, as well as some reasonably interesting tutorials from people such as prolific PD author Ralph Effemy. The price is £1.95, which I think is quite reasonable and considering that STOS owners are starved of such publications it might be an idea to check it out!! (full address at the end of the column)

Aaron Fothergill has just finished putting together the latest issue of the official STOS Newsletter, and it's not too bad at all! One of the main points for new subscribers to consider is that Aaron has prepared a disk for this "special" issue which contains lots of STOS extensions, including a couple of STE specific ones!!! I have not seen them yet but I'll tell you what they do next time around.

While on the subject of Aaron Fothergill, the company which publishes his brilliant game (SKYSTRIKE PLUS, have you got your copy yet?) has just released another STOS smasher. Written by John Shepherd (with neat graphics by Alastair Moffat) the game is an arcade adventure which looks incredibly like an old ZX Spectrum game ..... Trust me when I say

Continued on page 73

```
10 mode 0 : key off : curs off : flash off : hide on : click off
15 dim SC(12)
25 load "sprites.mbk"
30 X=hunt(start(1) to start(1)+length(1),"PALT")+4
40 for A=0 to 15 : colour A,deek(X+A*2) : next A
41 dim CX(9),CY(9),CD(9),CSP(9),GRD(41,26)
45 reserve as screen 10 : centre "PRESS MOUSE KEY TO START" : screen copy physic
to 10
46 DED=0 : goto 3200
50 cls back : cls physic : LV=3
505 limit mouse 0,160 to 311,182 : show on : change mouse 12 : MX=8
509 for X=0 to 41 : for Y=0 to 26 : GRD(X,Y)=0 : next Y : next X
510 rem
514 for Z=1 to 40
515 X=rnd(39)*8 : Y=rnd(19)*8 : sprite 1,X,Y,rnd(1)+11 : update : put sprite 1
516 GRD(X/8,Y/8)=1
520 next Z
525 for Z=1 to 8 : CY(Z)=0 : CX(Z)=-(Z*8) : CD(Z)=1 : CSP(Z)=1
530 next Z
535 CSP(1)=2
540 ZZ=rnd(3)*2 : for Z=1 to 8 : CSP(Z)=CSP(Z)+ZZ : next Z
990 auto back off : update off
995 gosub 4000
1000 rem loop
1001 gosub 2150
1002 gosub 3000
1003 if DN=1 then 510
1005 gosub 2000
1010 gosub 2100
1020 gosub 2150
1030 gosub 3000
1032 if DN=1 then 510
1035 gosub 3100
1800 if rnd(60)=1 and SPN=0 then SPN=1 : SPX=-50
1805 if SPX=-50 and SPN=1 and rnd(1)=0 then SPX=-8 : SPY=182 : SPXI=8 : SPYI=-8
: goto 1810
1806 if SPX=-50 and SPN=1 then SPX=320 : SPY=182 : SPXI=-8 : SPYI=-8
1810 if SPN=1 then gosub 3300
1820 gosub 2150 : gosub 3000
1850 if DRN=0 and rnd(50)=10 then DY=-8 : DX=(rnd(36)*8)+16 : DRN=1
1860 if DRN=1 then gosub 3500
1990 update
1999 goto 1000
2000 Z=1 : repeat
2002 X=CX(Z)/8 : Y=CY(Z)/8
2006 if Y=0 and X<0 then 2050
2020 if CD(Z)=1 then inc X
2024 if CD(Z)=2 and CX(Z)=0 then CD(Z)=1 : goto 2050
2026 if CD(Z)=2 and CX(Z)=312 then CD(Z)=3 : goto 2050
2027 if CD(Z)=2 then CD(Z)=((Y mod 2)*2)+1 : goto 2002
2030 if CD(Z)=3 then dec X
2032 if X=40 or X=0 then CD(Z)=2 : goto 2050
2040 if GRD(X,Y)=0 then 2050
2042 if CD(Z) mod 2=1 then CD(Z)=2
2050 rem move
2055 restore 2060 : for ZZ=1 to 3 : read A,B,C
2057 if CD(Z)=A then CX(Z)=CX(Z)+B : CY(Z)=CY(Z)+C
2058 next ZZ
2060 data 1,8,0,2,0,8,3,-8,0
2065 if CY(Z)=192 then CD(Z)=1 : CY(Z)=0 : CX(Z)=-8
2070 inc Z : until Z>MX
2080 for Z=MX to 1 step-1 : if CD(Z)<>4 then sprite Z,CX(Z),CY(Z),CSP(Z)
2082 next Z
2099 return
2100 rem us firing
2105 if mouse key mod 2<>1 then return
2115 if BN=0 then BN=1 else return
2120 BX=x mouse : BY=(y mouse/8)*8
2125 shoot
2149 return
2150 rem shoot em up
2159 HTT=0
2160 if BN=1 and BY-1 then Y=BY/8 : X=(BX+4)/8 : HTT=1
2162 if HTT=0 then 2170
2165 if GRD(X,Y)=1 then BN=0 : GRD(X,Y)=0 : sprite 15,(X*8),(Y*8),14 : update :
put sprite 15 : sprite off 15 : inc SC(10) : goto 4000
2170 BY=BY-8
2175 if BY<0 then BN=0 : sprite off 15
```

continued

```
2190 if BN=1 then sprite 15,BX,BY,10 else sprite off 15
2195 update
2199 return
3000 rem hit centi?
3005 DN=0
3010 ZZ=1 : repeat
3015 if BY<>CY(ZZ) then 3040
3020 if abs(CX(ZZ)-BX)>4 or BN=0 or CD(ZZ)=4 then 3040
3030 CD(ZZ)=4 : BN=0 : sprite 15,CX(ZZ),CY(ZZ),11+rnd(1) : update : put sprite
15 : sprite off ZZ : SC(10)=SC(10)+5 : gosub 4000 : GRD(CX(ZZ)/8,CY(ZZ)/8)=1 :
inc CSP(ZZ+1)
3040 inc ZZ : until ZZ>MX
3041 ZX=0 : for Z=1 to 8 : if CD(Z)<>4 then ZX=1
3042 next Z
3043 if ZX=0 then 3050
3045 if abs(SPX-BX)<5 and abs(SPY-BY)<6 and BN=1 and SPN=1 then SPN=0 : sprite
off 9 : SC(9)=SC(9)+5 : BN=0 : sprite off 15 : goto 4000
3046 if abs(DX-BX)<5 and abs(DY-BY)<9 and BN=1 and DRN=1 then DRN=0 : sprite off
10 : inc SC(9) : BN=0 : sprite off 15 : goto 4000
3049 return
3050 rem done level
3055 sprite off : DN=1
3060 SC(9)=SC(9)+5 : MX=8 : SPN=0 : sprite off 9
3070 BN=0
3099 return
3100 rem hit us?
3105 Z=1 : repeat
3110 XX=abs(x mouse-CX(Z)) : YY=abs(y mouse-CY(Z))
3115 if XX<8 and YY<6 and CD(Z)<>4 then 3120
3118 inc Z : until Z>MX
3119 return
3120 remLOSTLIFE
3121 MX=8 : for Z=1 to MX
3125 CX(Z)=-(Z*8) : CY(Z)=0 : CD(Z)=1
3130 next Z
3132 boom
3135 dec LV
3140 if LV=-1 then 3200
3145 for Z=1 to MX : CX(Z)=-(Z*8) : CY(Z)=0 : CD(Z)=1 : next Z
3146 ZZ=CSP(1) : for Z=2 to 8 : CSP(Z)=ZZ-1 : next Z
3150 SPN=0 : sprite off 9 : DRN=0 : sprite off 10
3199 return
3200 rem dead
3210 off : hide on : cls back : cls physic : screen copy 10 to back : screen
copy 10 to physic
3211 if DED<>0 then locate 1,15 : pen 1 : C$="YOU SCORED "+B$ : centre C$
3215 for Z=0 to 12 : SC(Z)=0 : next Z
3220 wait 100
3225 if mouse key=0 then 3225
3230 DED=1 : goto 50
3300 rem spider
3310 SPX=SPX+SPXI : SPY=SPY+SPYI
3315 sprite 9,SPX,SPY,13
3320 if SPY<144 then SPYI=8
3322 if SPY>181 then SPYI=-8
3325 if SPX<0 or SPX>320 then SPN=0 : sprite off 9
3340 if abs(x mouse-SPX)<8 and abs(y mouse-SPY)<8 and SPN=1 then SPN=0 : sprite
off 9 : goto 3120
3399 return
3500 rem dropper
3502 if abs(DX-x mouse)<8 and abs(DY-y mouse)<7 then 3120
3505 sprite 10,DX,DY,15
3510 if DY<0 or DY>159 or rnd(4)<>2 then 3550
3520 X=DX/8 : Y=DY/8
3525 if GRD(X,Y)<>0 then 3550
3530 GRD(X,Y)=1 : sprite 11,X*8,Y*8,11+rnd(1) : update : put sprite 11 : sprite
off 11
3550 DY=DY+8 : if DY>192 then DRN=0 : sprite off 10
3599 return
4000 rem display score
4005 if SC(1)>9 then for Z=1 to 12 : SC(Z)=0 : next Z : goto 4050
4010 Z=12 : repeat
4015 if SC(Z)>9 then inc SC(Z-1) : SC(Z)=SC(Z)-10 : goto 4015
4020 dec Z : until Z=0
4050 B$="" : for Z=1 to 12 : B$=B$+chr$(SC(Z)+48)
4055 next Z
4060 locate 1,24 : centre B$
4099 return
```

that the game is a little tricky to get used to ('cos it's so fast!) but if you don't buy it you must be stark raving bananas (where's that fresh cream!).

AN ARCADE CLASSIC

Program time!!! Nick Harper (sound familiar?) has written a freaky clone of the old arcade classic Centipede. There are two parts to the program, the first is the sprite data (TABLE 1) which you must enter using the INPDATA.ACB accessory which came with STOS (or the replacement published in this magazine many moons ago!), and the second is the actual program. Once typed in it may be best to compile it (if you own a copy of Mandarins STOS Compiler), this will really make the program whizz along. Unfortunately the listing is quite long so this is the bit where I say goodbyeeeeee. If you were wondering about the promised photo of myself and Aaron Fothergill (amongst others!), well I have it here but I think I'll let you wonder a little bit longer before revealing my face to the nation (just prepare yourselves - I am sure taking that photo damaged my camera!).

The STOS Magazine can be found at:

STOS MAGAZINE,
11 SHORE CRESCENT, BISHOPS WALTHAM, HANTS, SO3 1DZ

(if you want an issue make out a cheque - payable to WISEGUY PUBLICATIONS for £1.95)

The official STOS CLUB can be found at:

STOS CLUB, 1 LOWER MOOR, WHIDDON VALLEY, BARNSTAPLE, NORTH DEVON, EX32 8NW

(subscriber enquiries can phone 0271 23544 quoting this issue of NAU)

Finally I can be found happily dialling up a mega phone bill at the following address (and if you are going to write to me don't bother about moaning that NAU doesn't offer good value for money and I should move onto a better magazine 'cos you will end up in the bin, even if you do send an S.A.E. ok? - this remark is specifically aimed at Michael Sime who quite fairly also moaned about Mandarins crappy STOS support!).

PETER HICKMAN
36 CLEVERLY ESTATE
WORMHOLT ROAD
LONDON
W12 OLX

ORIGINAL FILENAME : SPRITES.MBK
BANK NUMBER : 1
BANK LENGTH : 1536

Adrs	Datas								Check
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0010	000F	*0006	009C	0108	*0004	00EC	0108	*0004	303B5
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003C	*0004	022C	0108	*0004	027C	0108	*0004	02CC	30990
0052	0108	*0004	031C	010A	*0004	0380	010A	*0004	309C4
0068	03E4	0107	*0004	042A	0107	*0004	0470	010A	20F9E
007C	*0004	04D4	0108	*0004	0524	0108	0000	5041	25C51
0090	4C54	0000	0777	0666	0555	0333	0057	0036	06346
00A0	0026	0070	0050	0030	0705	0770	0740	0710	01DDB
00B0	0000	81FF	00FF	00FF	00FF	00FF	00FF	00FF	087F9
00C0	81FF	7E00	7E00	7E00	0000	C700	FF00	FF00	4C0FF
00D0	0000	BB00	C700	FF00	0000	BB00	C700	EF00	4F200
00E0	0000	B300	CF00	FF00	0000	C700	FF00	FF00	54600
00F0	0000	FF00	FF00	FF00	0000	7E00	7E00	7E00	47700
0100	0000	81FF	00FF	00FF	00FF	00FF	00FF	00FF	087F9
0110	81FF	7E00	7E00	7E00	0000	C700	FF00	FF00	4C0FF
0120	0000	FF00	8100	9900	0000	FF00	8100	9900	43200
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0160	81FF	*0004	7E00	0000	3800	3800	C700	0000	33703
0172	4400	7C00	8300	0000	5400	6C00	8300	0000	28600
0182	4C00	7C00	8300	0000	3800	3800	C700	*0006	38206
0196	FF00	*0006	7E00	0000	81FF	00FF	00FF	00FF	30202
01AA	00FF	00FF	00FF	81FF	*0004	7E00	0000	3800	23800
01BC	3800	C700	0000	6600	1800	8100	0000	6600	26400
01CC	1800	8100	0000	6E00	3C00	A500	2400	3800	24400
01DC	3800	C700	*0006	FF00	*0006	7E00	0000	81FF	4FE0B
01F4	00FF	00FF	00FF	00FF	00FF	00FF	81FF	0000	087F9
0204	7E00	0000	7E00	3800	C700	0000	FF00	4400	33E00
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02A4	7E00	7E00	7E00	3800	C700	FF00	FF00	4400	4B800
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02C4	8300	FF00	FF00	3800	C700	FF00	FF00	0000	57E00
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02E4	00FF	00FF	00FF	00FF	00FF	00FF	81FF	0000	087F9
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0304	8100	9900	9900	6600	8100	9900	9900	6E00	43A00
0314	A500	BD00	BD00	3800	C700	FF00	FF00	0000	51C00
0324	FF00	FF00	FF00	0000	7E00	7E00	7E00	F7FF	56EFF
0334	E3FF	C1FF	80FF	80FF	007F	007F	007F	007F	2A9F8
0344	007F	0800	0800	0800	0800	1C00	1400	1400	0647F
0354	1400	3E00	3600	2200	3600	7F00	7F00	6300	24100
0364	7F00	5D00	5D00	7700	5D00	AA80	BE80	C980	43F80
0374	8880	AA80	B680	C180	8080	2200	3E00	C180	44D00
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03A4	E3FF	F7FF	FFFF	0800	0800	0800	0800	1400	30FFD
03B4	1400	1C00	1C00	2200	2200	3E00	3E00	2A00	13600
03C4	2200	3E00	3E00	3E00	2200	3E00	3E00	2A00	1A400
03D4	3600	3E00	3E00	1400	1C00	1C00	1C00	1400	12E00
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03FA	C3FF	81FF	00FF	18FF	E7FF	E7FF	C3FF	3800	428F9
040A	0400	2C00	2C00	7400	0A00	7A00	7A00	E000	2AE00
041A	1F00	BF00	BF00	E000	0700	E700	E700	1000	46200
042A	1000	0800	0000	1000	1000	0800	0000	2000	06000
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044A	E7FF	C3FF	2C00	*0004	3C00	4800	0600	0000	36202
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047C	0000	2000	3000	0C00	0000	E3FF	C1FF	80FF	282FD
048C	007F	007F	007F	007F	00FF	1C7F	BEFF	1C00	0FA79
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04EC	00FF	00FF	00FF	00FF	00FF	00FF	00FF	FF00	105F9
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050C	FF00	FF00	FF00	FF00	FF00	FF00	FF00	FF00	7F800
051C	FF00	FF00	FF00	FF00	FF00	FF00	FF00	FF00	7F800
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053C	81FF	00FF	00FF	00FF	00FF	81FF	C3FF	3C00	207F9
054C	3C00	3C00	3C00	7E00	7E00	4200	7E00	FF00	36F00
055C	CF00	8100	CF00	FF00	CF00	8100	CF00	FF00	63C00
056C	FF00	8100	FF00	FF00	FF00	8100	FF00	7E00	67B00
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058C	FC3F	DF6F	0180	3C3C	7C3E	7F6E	0180	1818	32EAE
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05BE	2CFC	0000	0001	202C	FE00	*0004	2CFE	*0004	3782F
05D2	2CFE	*0004	0004	4C4F	4F50	0000	0010	0008	1C8BD
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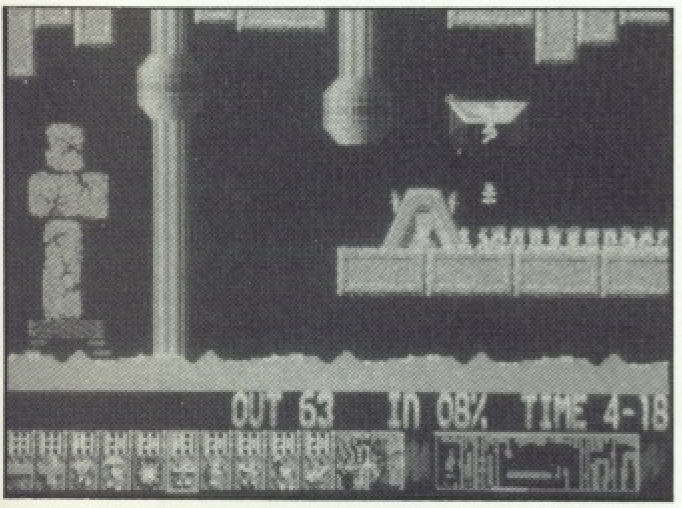
END OF BANK

LEMMINGS

I planned to start writing this review at nine o'clock this morning, but I decided to have another quick go at Lemmings first - it is now five o'clock! WARNING: Lemmings is highly addictive! It is one of those games where you know you can finish the level if you have just one more go!

Lemmings is a brilliantly simple arcade game. Tiny, but perfectly formed and animated, lemmings pour onto the screen and start marching single-mindedly forwards, completely oblivious to the dangers which surround them. You are their only hope. Using your mouse you can select skills to allocate to particular lemmings from a row of icons at the bottom of the screen. The skills are: Climber, Floater, Bomber, Blocker, Bridge Builder, Basher, Miner and Digger. But on any particular level you may only have a limited numbe̊r of each skill to use.

The superb manual shows a typical scenario: the lemmings start at the top of a cliff and to stop them wandering off the edges and going splat you must assign one lemming at each side to the job of being a Blocker. But you must be sure to let at least one lemming through before you create the Blocker so that he can build a safe route for the others. You quickly select Floater and click on this worker lemming so that when he blunders off the edge of the cliff he opens his brolly and floats gently to the ground below.



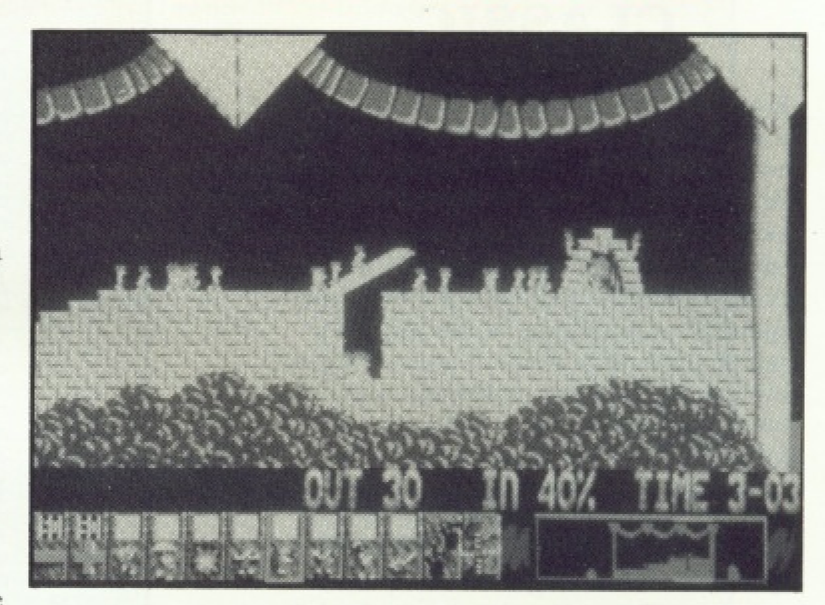
You then set him building bridges to make a route to the top of the next cliff. To avoid the next drop you make him a Miner and he digs a diagonal route through the cliff to the next valley (Diggers dig vertically and Bashers Horizontally). Faced by a deadly pool of water you set him bridge building again. Bash your way through the next cliff face, and are confronted by a strange pillar with one way arrows all over it. It can only be Bashed from the other side, so you make him a Climber and he gets past that obstacle. The manual shows the lemming now turning around and Bashing through the pillar, unfortunately it is not that easy as the lemmings are so stupid that they will not turn around unless they hit an obstacle.

You really need another lemming out there to act as a Blocker and make his partner turn back and Bash through the one-way pillar! Now, having created a safe route, you can blow up your Blockers (this really is rather a sick game in many respects!) by turning them into Bombers and the lemmings will march blindly across the screen to the exit! Only 149 levels to go!

There are 30 beautifully designed, scrolling FUN levels for you to learn how to control your lemmings, then 30 TRICKY ones, 30 TAXING ones, and finally 30 levels of MAYHEM! In the harder levels you have to cope not only with the difficulties of the terrain, but also with traps scattered all over the place! Some of the levels are repeats of earlier ones with parameters changed to make life harder - parameters include: what skills you have available, what percentage of the lemmings you have to save, and how much time you have to do it!

There is a password for every level so you can always restart from where you left off, and the four styles (fun, tricky, taxing and mayhem) are independent so if you get stuck you have three other levels to work at.

It is a little frustrating at times, especially when there are so many lemmings milling around that you can't get one to build or dig in the right direction - you often need to plan your crowd control in advance or you haven't a chance of surviving.



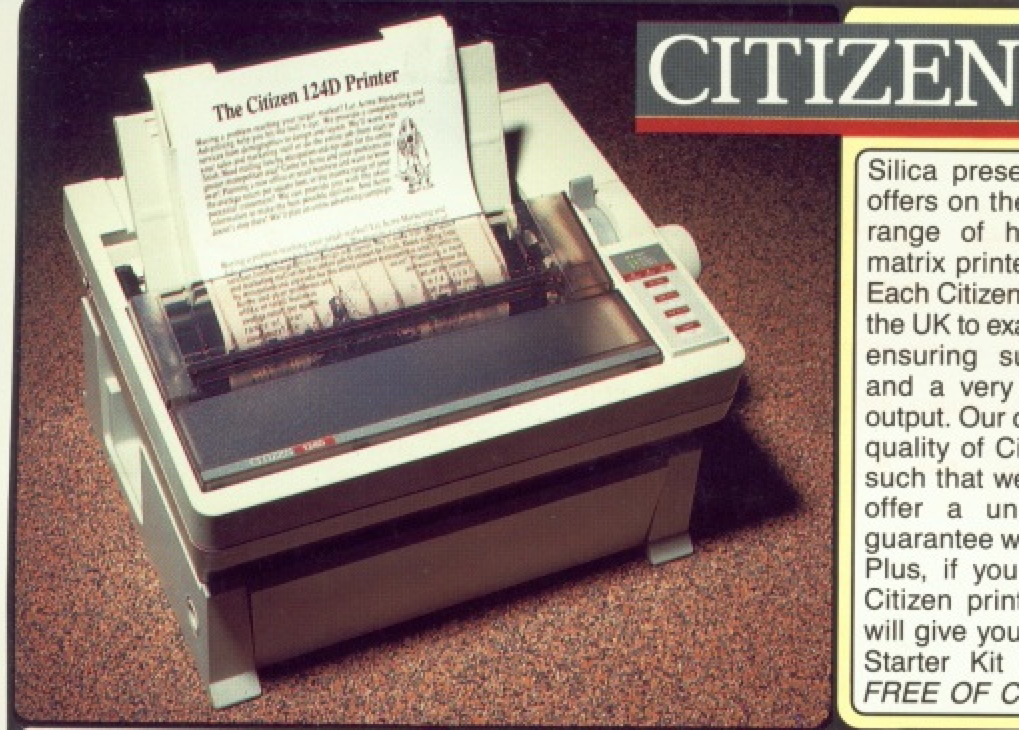
'highly addictive'

The background graphics are great and very varied, the animation is superb - each different skill is fully animated and the sight of hundreds of lemmings marching over the edge of a cliff and going splat on the ground below is brilliant!

As if that wasn't enough there are another 20 2-player levels as well. This is a proper 2-player game, not just taking it in turns at a 1-player game. The screen is split vertically down the middle and the halves scroll independently. Each player starts with 40 lemmings, and as well as keeping them alive he can try and direct the enemy lemmings to his exit, or sabotage the enemy's escape route! The second player has to use the joystick and/or the keyboard but it is quite playable once you get used to it.

- ***SIGHT & SOUND*** - *Superb graphics and animation, lots of happy music and some nice sound effects*
- ***GAMEPLAY*** - *Brilliantly simple and innovative, highly addictive. Frustrating at times, but generally excellent*
- ***VERDICT*** - *If you are fed up with mindless blasting then rush out and buy it now!*

Title:	**LEMMINGS**
Publisher:	**Psygnosis**
Price:	**£25.99**
Reviewer:	**John Sweeney**



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FREE COLOUR KIT
Worth £39.95 - With Swift 9 and Swift 24 printers.

2 YEAR WARRANTY
Silica offer a 2 year warranty (including the printer head) with every Citizen printer purchased from Silica.

WINDOWS 3.0
Free Windows 3.0 driver - In the Silica Starter Kit.

FREE HELPLINE
Technical support helpline open during office hours.

MADE IN THE UK
Citizen printers are manufactured to high standards.

144 CPS DRAFT 9 PIN



CITIZEN 120D+

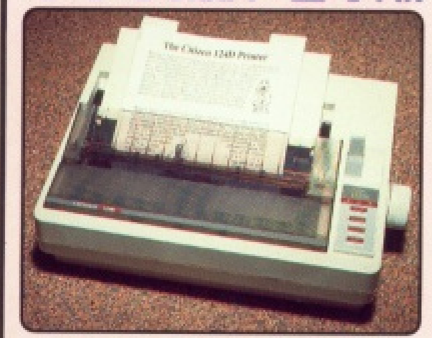
The Citizen 120D+ is one of the UK's best selling printers. It has a stylish appearance and excellent features and performance for such an inexpensive printer. The 120D+ is available with either a serial or parallel interface and is an ideal first printer.

- *9-pin Printhead*
- *Print Speed 144cps Draft*
- *30cps NLQ*
- *Epson & IBM Graphics Emulation*
- *Pull Tractor & Bottom Feed*
- *Superior Graphics - 240×216dpi*
- *FREE Starter Kit*

RRP £233.83
STARTER KIT £29.95
TOTAL RRP: £263.78
SAVING: £112.20
SILICA PRICE: £151.58

£129 +VAT = £151.58

144 CPS DRAFT 24 PIN



CITIZEN 124D

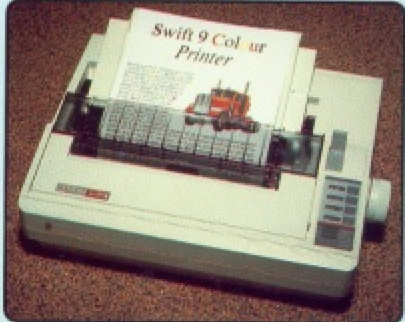
The award winning Citizen 124D brings high quality 24-pin dot matrix printing within every computer users reach. It is the ideal choice where high quality printing is required at a budget price.

- *24-pin Impact Printer*
- *Print Speed 144cps Draft*
- *2 LQ Fonts (48cps)*
- *8K Buffer*
- *Epson, IBM & NEC P6+ Emulation*
- *Advanced Paper Parking*
- *Superior Graphics - 360×360dpi*
- *FREE Starter Kit*

RRP £292.58
STARTER KIT £29.95
TOTAL RRP: £322.53
SAVING: £112.20
SILICA PRICE: £210.33

£179 +VAT = £210.33

192 CPS DRAFT 9 PIN



SWIFT 9 - COLOUR!

The Citizen Swift 9 is perfect for those who require high quality dot matrix black or colour printing at a budget price. The print quality of Swift 9 rivals that of other manufacturer's 24-pin models.

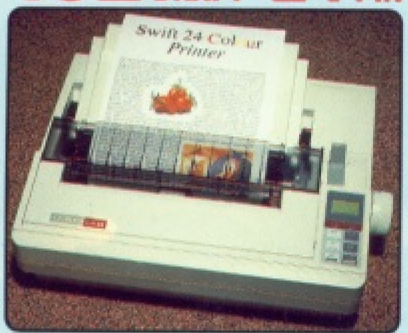
- *9-pin Impact Printer*
- *Print Speed 192cps Draft*
- *3 NLQ Fonts (48cps)*
- *8K Buffer*
- *Epson & IBM Graphics Emulation*
- *Advanced Paper Parking*
- *FREE Starter Kit*
- *FREE Colour Kit*

FREE! COLOUR KIT

RRP £280.83
STARTER KIT £29.95
COLOUR KIT £44.65
TOTAL RRP: £355.43
SAVING: £133.35
SILICA PRICE: £222.08

£189 +VAT = £222.08

192 CPS DRAFT 24 PIN



SWIFT 24 - COLOUR!

The Citizen Swift 24 is one of Europe's best selling printers and has won awards including Printer Of The Year 1990. Its rapid print speed, quality and black or colour options, make it a natural choice.

- *24-pin Impact Printer*
- *Print Speed 192cps Draft*
- *4 NLQ Fonts (64cps)*
- *8K Buffer*
- *Epson, IBM & NEC P6+ Emulation*
- *Advanced Paper Parking*
- *FREE Starter Kit*
- *FREE Colour Kit*

FREE! COLOUR KIT

RRP £428.88
STARTER KIT £29.95
COLOUR KIT £44.65
TOTAL RRP: £503.48
SAVING: £199.15
SILICA PRICE: £304.33

£259 +VAT=£304.33

PRINTER ACCESSORIES



SHEET FEEDERS		
PRA 1200	120D	£71.38
PRA 1215	124D/Swift 9/24	£88.70
PRA 1228	124D/Swift 9/24	£42.00
SERIAL INTERFACES		
PRA 1189	120D+	£56.45
PRA 1209	Swift 9/124D	£32.25
PRA 1709	Swift 24	£26.38
PRINTER STAND		
PRA 1242	124D/Swift 9/24	£24.03
ORIGINAL RIBBONS		
RIB 3520	120D/Swift 9 Black	£4.11
RIB 3924	124D/Swift 24 Black	£4.70
RIB 3936	Swift 9/24 Colour	£15.63
COLOUR KITS		
PRA 1236	Swift 9/24	£39.65

All prices include VAT and Free delivery.

FREE! STARTER KIT

Every Citizen printer from Silica, comes complete with the Silica Printer Starter Kit, including everything you need to get up and running with your new printer immediately, FREE OF CHARGE!

- *3½" Dual Format Disk with Amiga & ST Printer Drivers*
- *3½" Disk with Drivers for Microsoft Windows 3*
- *2 Metre Parallel Printer Cable*
- *200 Sheets of High Quality Continuous Paper*
- *200 Continuous Address Labels on Tractor Feed*
- *5 Continuous Envelopes on Tractor Feed*



If you already own a printer, and would like a Silica Printer Starter Kit, you may order one (ref: KIT 5000) for the special Silica price of £24.95 - £5 off RRP!

NORMAL RRP **£29.95**

SILICA SYSTEMS OFFERS YOU

- *FREE OVERNIGHT COURIER DELIVERY:* On all hardware orders shipped in the UK.
- *TECHNICAL SUPPORT HELPLINE:* Team of PC technical experts at your service.
- *PRICE MATCH:* We normally match competitors on a "Same product - Same price" basis.
- *ESTABLISHED 12 YEARS:* Proven track record in professional computer sales.
- *£13M TURNOVER (with 60 staff):* Solid and reliable with maintained growth.
- *BUSINESS/EDUCATION/GOVERNMENT:* Volume discounts available for large orders.
- *SHOWROOMS:* Demonstration and training facilities at our London & Sidcup branches.
- *THE FULL STOCK RANGE:* All of your PC requirements from one supplier.
- *FREE CATALOGUES:* Will be mailed to you with offers and software/peripheral details.
- *PAYMENT:* By cash, cheque and all major credit cards.

Before you decide when to buy your new printer, we suggest you think very carefully about WHERE you buy it. Consider what it will be like a few months after you have made your purchase, when you may require additional peripherals or software, or some technical help and advice. And, will the company you buy from contact you with details of new products? At Silica Systems, we ensure that you will have nothing to worry about. Silica Systems is one of the UKs leading independent computer dealers and provides a quality service to users at home, in education and in business throughout the nation. Silica have been established for over 12 years, and have an annual turnover of £13 million. With our unrivalled experience and expertise, we can now claim to meet our customers requirements with an understanding which is second to none. But don't just take our word for it. Complete and return the coupon now, for our latest Free literature on the Citizen printer range and begin to experience the "Silica Systems Service".

SILICA SYSTEMS

MAIL ORDER: Order Lines Open: Mon-Sat 9.00am-6.00pm	1-4 The Mews, Hatherley Rd, Sidcup, Kent, DA14 4DX	No Late Night Opening	Tel: 081-309 1111 Fax No: 081-308 0608
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LONDON SHOP: Opening Hours: Mon-Sat 9.30am-6.00pm	Selfridges (1st Floor), Oxford Street, London, W1A 1AB	Late Night: Thursday until 8pm	Tel: 071-629 1234 Extension: 3914
SIDCUP SHOP: Opening Hours: Mon-Sat 9.00am-5.30pm	1-4 The Mews, Hatherley Rd, Sidcup, Kent, DA14 4DX	Late Night: Friday until 7pm	Tel: 081-302 8811 Fax No: 081-309 0017

To: Silica Systems, Dept PSIX-0991-55 1-4 The Mews, Hatherley Rd, Sidcup, Kent, DA14 4DX

PLEASE SEND CITIZEN PRINTER INFORMATION

Mr/Mrs/Ms: .... Initials: .... Surname: ....

Address: ....

....

.... Postcode: ....

Tel (Home): .... Tel (Work): ....

Company Name (if applicable): ....

Which computer(s), if any, do you own? ....

E&OE - Advertised prices and specifications may change - Please return the coupon for the latest information.

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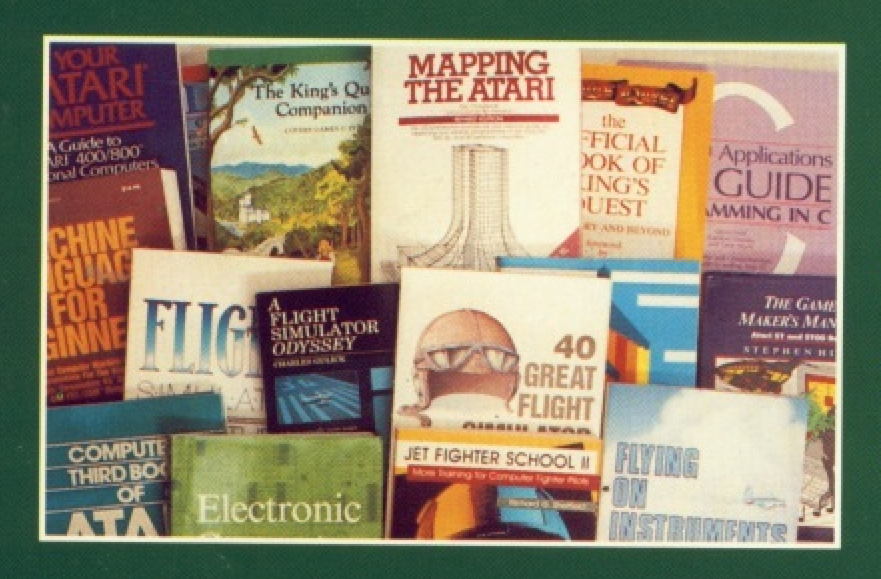


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